REPORT

ON THE

HEALTH OF THE CITY

OF

BIRMINGHAM,

FOR THE YEAR 1898

ALSO,

ON THE PROCEEDINGS TAKEN UNDER THE ACTS FOR THE

PREVENTION OF ADULTERATION

OF FOOD AND DRUGS,

BY

ALFRED HILL, M.D., F.R.S.E., F.I.C.,

Past-President of the Society of Medical Officers of Health; Past-President of the Society of Public Analysts; Late Examiner in Public Health to the University of Aberdeen; Fellow of the Sanitary Institute; Fellow of the College of State Medicine; Fellow of the Incorporated Society of Medical Officers of Health;

MEDICAL OFFICER OF HEALTH AND ANALYST TO THE CITY.

PRINTED BY ORDER OF THE HEALTH COMMITTEE.

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With the Medical Officer of Health's

Compliments.

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Health Department,

The Council House, Birmingham,

March 31st, 1899.

TO THE HEALTH COMMITTEE.

Mr. Chairman and Gentlemen,

Introductory Remarks.

I beg to present to you my 26th Annual Report as Medical Officer of Health for the City.

The statistics for the year 1898 are, generally speaking, of a more satisfactory character than those of the last few years. The death-rate was below the average, and all the chief zymotic diseases except Typhoid Fever and Diarrhœa had a smaller mortality than usual. In many respects, however, Birmingham again compares unfavourably with the other great towns.

In consequence of the rather extensive prevalence of Typhoid Fever, I have devoted a considerable part of my report to certain features connected with the spread of this disease, especially with regard to the possibility of the infection spreading through the soil, and to the advantage of a public hospital for the treatment of Typhoid Fever cases. I have not dwelt very fully upon the mortality from Diarrhœa, as this subject was treated at length in my last Annual Report.

In order to locate more accurately the abnormal mortality recorded in certain parts of the town, I have obtained the death-rates in as many streets as possible in

Introductory Remarks—*continued.*

three of the most unhealthy wards. These are of much interest as showing more exactly than has ever been done before the precise localities in which unhealthy conditions exist, and exercise a marked influence.

During the year more definite action has been commenced with the object of diminishing the still excessive death-roll from Consumption.

With regard to the sanitary staff I look forward with much confidence to the work just commencing by the Health Visitors, which I consider will be of great practical value.

The increased activity shown in the conversion of pan and ashpit privies, and the steps taken to maintain both yards and privies in a clean and sanitary condition will, I have no doubt, to a certain extent exert a beneficial influence on the health of the City.

POPULATION.

Population.

By the ordinary method of estimation, the population at the middle of 1898 should have been 510,343, that being the figure which would have been reached if the rate of increase observed between 1881 and 1891 had continued from 1891 to 1898.

In 1891, however, there were on an average 5·0 inmates to every inhabited house in the city. The Overseers of the Poor for the various parishes very kindly supplied me in April last with returns showing that at that time there were over 105,000 inhabited houses, so that if there are still 5·0 persons to a house the population of the city last year would be about 525,000 or 15,000 more than the Registrar-General's official estimate.

Of course it is not possible to say with certainty that the number of inmates is exactly 5·0 per house at the present time, and it is difficult to decide which estimate of the population shall be used. Perhaps it will be better under the circumstances to use the figure obtained by the

Registrar-General's method. If this figure should prove to be, as suggested, 15,000 below the actual population, then the birth-rate given in this report, being calculated on an under-estimated population, will be found to be about 1 per 1,000 too high, and the death-rate about ·5 too high. Population—*continued.*

Any uncertainty as to the actual population of his district is very embarrassing to a Medical Officer of Health who wishes to prepare accurate and trustworthy statistics, and it seems a pity that the difficulty has not been met before now by the institution of a quinquennial instead of a decennial census.

MARRIAGES.

The number of marriages during the year was 5,321 equal to a marriage rate of 20·9 per 1,000. This was a rather high rate, though lower than in 1897. In the seven years, 1892-1898, the rates have been as follows:— Marriage-rate.

	Marriage-rate per 1,000.
1892	17·9
1893	16·9
1894	17·3
1895	17·9
1896	20·0
1897	21·9
1898	20·9

BIRTHS.

The birth-rate for 1898 was 34·0 per 1,000. It was higher than in any year since 1886, and 1·6 above the average for the five previous years. This increase in the birth-rate lends additional probability to the supposition that the population is under-estimated. Birth-rate.

According to the figures given in Table VI. and taken from the Registrar-General's Annual Summary, the birth-rate in the thirty-three large English towns was only 30·3, and all the towns except five had lower rates than Birmingham.

DEATHS.

Death-rate.

The death-rate for the year was 19·5 per 1,000, and an examination of the figures in Table II. shows that this death-rate was ·7 below the quinquennial average. It was considerably lower than the rates for 1895, 1896 and 1897, which were 19·9, 20·4 and 21·1 respectively. It was, however, much higher than in 1894, when 18·2 was recorded. The death-rate was thus a fairly good one when compared with previous figures relating to Birmingham.

Death-rates in great towns.

How does this death-rate stand in relation to those of other large towns? This may be discovered by reference to Table VI. It will be found that eight towns had worse death-rates than this city, while the other twenty-four towns had better death-rates than Birmingham, so that Birmingham stood twenty-fifth on the list. Its position in each year since 1892 is shown below :—

1892	...	...	...	20th.
1893	..	...	...	23rd.
1894	..	...	...	23rd.
1895	...	...	...	19th.
1896	...	...	...	30th.
1897	...	...	...	27th.
1898	...	...	...	25th.

These figures are not satisfactory, for they show that in the last three years Birmingham held a worse place among the great towns than in the four preceding years. To some extent, however, the dissatisfaction is lessened by the fact that last year the position of Birmingham was much better than in 1896 or 1897.

The death-rates for some of the towns mentioned in Table VI. are exceedingly low. Amongst the most noteworthy are 14·8 in Cardiff, 15·4 in West Ham, 15·9 in Huddersfield, 17·2 in Bristol, and 18·7 in London. Such death-rates as these must excite the envy of less favoured communities and should stimulate them to further effort on their own behalf.

Variations in mortality.

It will now be well to enquire what diseases were chiefly concerned in the improvement which took place last year in

the death-rate. This may be seen from the following statement.

	Deaths in 1898.	Average 1893-97.	Increase or Decrease.
Bronchitis, Pneumonia, and Pleurisy ...	1,626	1,895	- 269
Measles	182	244	- 62
Scarlet Fever	47	105	- 58
Diphtheria and Membranous Croup ...	132	168	- 36
Debility and Wasting	639	665	- 26
Whooping Cough ...	256	265	- 9
Tubercular Diseases ...	954	960	- 6
Premature Birth ...	372	378	- 6
Enteritis	544	292	+252
Diarrhœa	668	640	+ 28
Heart Disease ...	674	610	+ 64
Nervous Diseases ...	963	927	+ 36
Typhoid Fever	113	96	+ 17
Cancer	342	334	+ 8
Old Age	475	470	+ 5

From these figures it is evident that a very large part of the reduction in mortality was due to chest affections, which are greatly influenced by the character of the weather. The year 1898 was marked by a singular absence of very cold weather either in the earlier or later months. January and December were unusually warm, the mean temperature being 6°·2 above the average in the former month and 6°·7 above in the latter.

Effect of mild weather.

Contrary, perhaps, to popular opinion, the effect of a mild winter on the mortality in Birmingham is generally very favourable, especially in the reduction of deaths from respiratory diseases. This can hardly be a cause of surprise when it is remembered that a very large proportion of the people are badly housed, insufficiently clothed and poorly fed ; and that during a severe winter their hardships are increased by want of employment in many of the out-door trades. If everyone could have a comfortable house, warm clothes, and a good supply of food, perhaps the effect of a hard winter would not be very noticeable, but under present conditions it is, and must continue to be, both obvious and deplorable.

Zymotic mortality.

All the principal zymotic diseases, except typhoid fever and diarrhœa, had a decreased mortality, but unfortunately the increase in infantile enteritis, which perhaps ought to be classed as diarrhœa, was so large as to quite outweigh the falling off in the other zymotics. The figures relating to typhoid fever and diarrhœa constitute an important feature in the year's statistics and will receive further attention in another part of this report.

Population and death-rates in wards.

It is always interesting and instructive to know the death-rates of the various wards of the city. Owing to the large number of persons who die in Institutions and whose addresses are not known to me, it is impossible to calculate the ward death-rates with exactitude, but the approximate figures are as follows :—

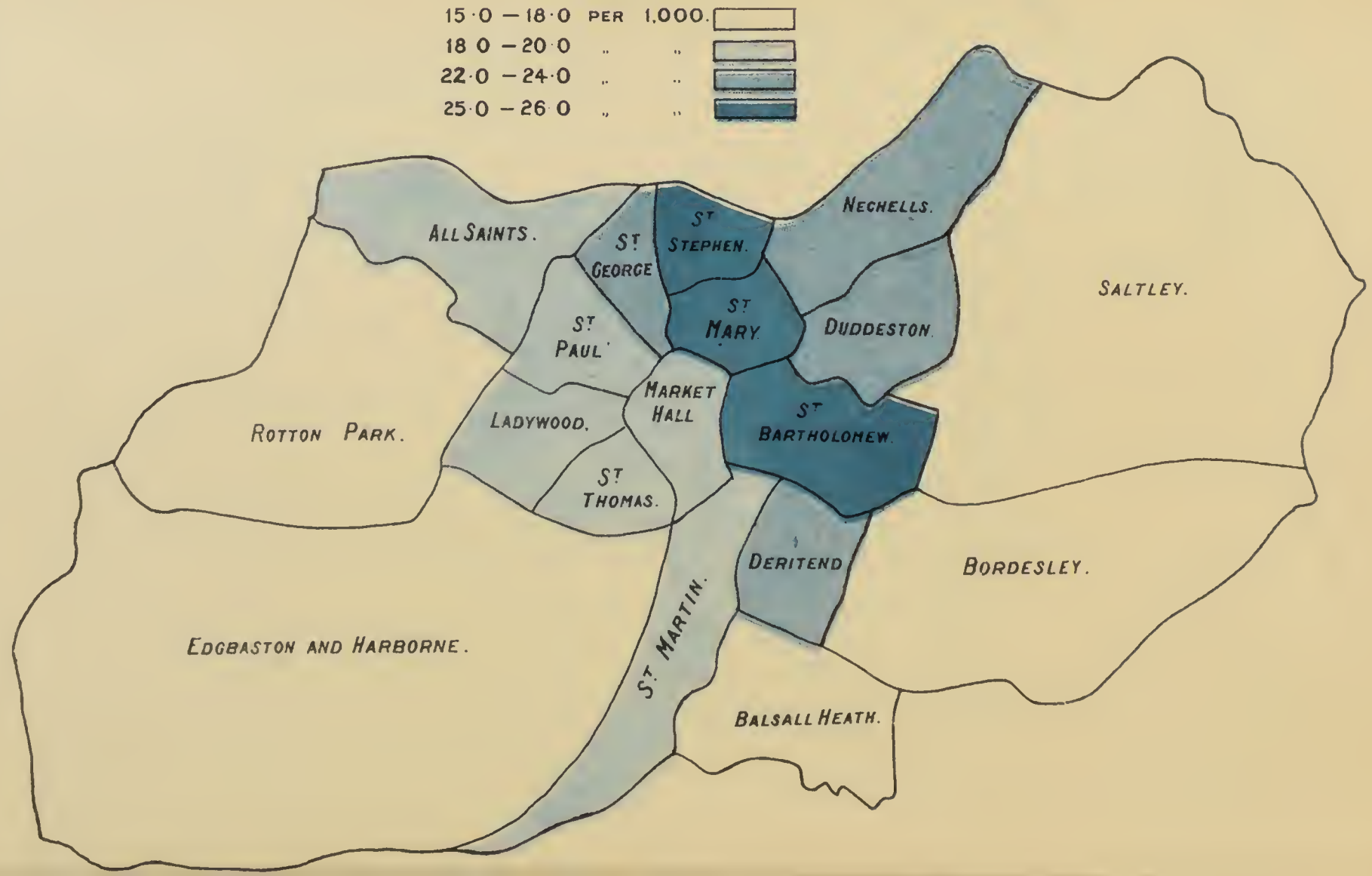
	Estimated Population.	Approximate Death-rate.
St. Bartholomew's	26,000	25·2
Deritend	26,900	23·5
St. Stephen's	24,200	22·6
Duddeston	25,800	22·3
St. George's	21,600	22·2
St. Mary's	16,000	21·9
Nechells	34,200	21·1
St. Martin's	25,300	20·1
Ladywood	26,500	19·2
St. Thomas's	19,300	18·8
St. Paul's	17,500	17·4
Balsall Heath	41,000	17·4
Rotton Park	43,400	17·3
All Saints'	41,200	17·2
Saltley	35,000	17·1
Market Hall	12,500	16·6
Edgbaston and Harborne ...	31,000	15·9
Bordesley	54,000	15·4

Much the same wards as usual are to be found at the top and bottom of the list, showing that their high or low mortality is not due to accident, but is the inevitable result of the conditions under which life has to be lived in them. Ward death-rates have now been calculated over a period of five successive years, and in every one of them St. Bartholomew's, St. Stephen's, St. Mary's, Deritend, St. George's, Duddeston, and Nechells have invariably been placed amongst the nine worst wards. The high mortality in the wards mentioned appears under present conditions to be chronic.

Quinquennial death-rates in wards.

Death-rates in small areas like wards are naturally subject to a certain amount of accidental fluctuation, the

DEATH RATE FROM ALL CAUSES 1894-1898.



effect of which is greatly reduced by taking the mean mortality for a series of years. During the past five years the average death-rates of the wards have been as follows:—

	Death-rate 5 years, 1894-1898.
St. Bartholomew's	26·0
St. Stephen's	25·8
St. Mary's	25·3
Deritend	23·7
St. George's	23·5
Duddeston	22·7
Nechells	21·9
St. Thomas's	20·2
St. Martin's	19·5
Ladywood	19·2
All Saints'	18·9
St. Paul's	18·8
Market Hall	18·0
Rotton Park	17·6
Saltley	17·1
Bordesley	16·5
Balsall Heath	16·1
Edgbaston and Harborne	14·9

These death-rates may be taken as an accurate index of the mortality in the different wards, and the map on the opposite page shows in a graphic manner the parts of the town which have the highest death-rates. In a later part of this report the same death-rates have been used in preparing charts showing the connection between the high mortality and certain sanitary and social conditions.

Death-rates in streets.

The fact that St. Bartholomew's, St. Stephen's and St. Mary's almost always have the highest ward death-rates makes it desirable that some further inquiry should be made respecting these districts; and during the past year an effort was made to obtain the death-rates in the individual streets which compose these wards, so that it might be seen whether the high mortality was common to the whole ward or was confined to certain streets.

Such an enquiry would not have been possible except for the fact that about the end of 1897 your Committee arranged for an enumeration of the population, number of houses, and certain sanitary conditions in every street in the town. By means of this enumeration a vast amount of very valuable information has been obtained.

In calculating the death-rates in streets it has been necessary to deal with the mortality in a complete decennium in order to avoid any errors arising from inadequacy of numbers; and since the mortality covers a period of 10 years, all streets in which the population has largely increased or decreased during that time have had to be omitted. The deaths in institutions have been distributed *pro rata* over the various streets.

St. Bartholomew's Ward.

Street.	Annual Death-rate in 10 years, 1888-1897.	Percentage of Houses without through ventilation.	Percentage of Houses rented at 3/6 or less.
Barn Street	42	83	49
Trent Street	41	55	72
Buck Street	41	81	38
Belmont Passage	39	46	54
New Bartholomew Street	39	55	45
Palmer Street	38	78	71
Great Barr Street	38	44	36
Little Barr Street	36	26	55
Park Lane	35	85	70
Glover Street	34	63	44
Bartholomew Street	33	70	51
Derby Street	31	63	43
Bromley Street	31	29	29
Banbury Street	30	35	45
Adderley Street	30	64	35
Fazeley Street	30	57	28
Floodgate Street	30	83	23
Heath Mill Lane	30	58	13
Montague Street	29	22	40
Watery Lane	29	48	28
Upper Trinity Street	29	74	27
Liverpool Street	28	29	21
River Street	28	72	16
Saltley Street	27	46	30
Howe Street	26	59	23
Meriden Street	26	57	37
High Street, Deritend, and Bordesley	25	57	46
Allcock Street	25	47	23
Witton Street	25	37	22
Westley Street	25	81	4
Bartholomew Row	24	57	23
Keeley Street	24	61	0
New Bond Street	24	68	0
Doe Street	23	50	24
Fox Street	23	63	29
Oxford Street	23	61	16
Kingston Road	23	10	0
Pickford Street	22	83	15
Gibb Street	22	55	17
Lower Trinity Street	21	80	53
Lower Dartmouth Street	21	36	30
Nova Scotia Street	21	59	13
St. Andrew's Road	20	27	1
Robert Road	20	0	0
Princes Street	18	20	35
Dart Street	13	80	0

Death-rates in streets in St. Bartholomew's ward.

The death-rates obtained for St. Bartholomew's ward are shown in the table on the opposite page, together with the percentage of houses with front ventilation only, and the percentage of houses let at a very low rent. The latter figures carry the enquiry farther than the street death-rates can do, inasmuch as they offer an indication not merely of the streets but of the class of houses in which the high mortality takes place.

The figures in the table are very striking, and deserve the closest attention. In the first place, they show that the healthiness of the different streets varies enormously. At the beginning of the list there are 11 streets whose death-rates range from 33 to 42 per 1,000. These are terribly high figures. On the other hand, at the end of the list there are seven streets in which the death-rate does not exceed 21 per 1,000.

It must be possible, therefore, for streets in St. Bartholomew's ward to be fairly healthy. The unhealthiness of the great majority of the streets is clearly due not to their situation, but to their condition.

High death-rates and deficient ventilation.

A study of the figures in the second column of the table shows that the very bad death-rates are in streets in which there is a large percentage of back-to-back houses—houses with front ventilation only. In the eleven streets whose death-rates range from 33 to 42 per 1,000 the average proportion of back-to-back houses is 62 per cent. In the seven streets, whose death-rates do not exceed 21, the proportion is 43 per cent.

High death-rates and low rented houses.

But the connection between low-rented houses and a high death-rate is still more striking, for on an average there are 53 per cent. of houses at 3s. 6d. a week or less in the very bad streets; in the good streets the average percentage is only 20. The excessive mortality is therefore very noticeable in streets in which low-rented houses are most common.

St. Stephen's Ward.

Street.	Annual Death rate in 10 years, 1888-1897.	Percentage of Houses without through ventilation.	Percentage of Houses rented at 3 6 a week or less.
Gee Street	39	84	53
Moorsom Street	36	63	64
Pritchett Street	33	73	46
Brass Street	33	86	75
Blews Street	32	64	69
New John Street	32	62	47
Manchester Street	31	57	57
Rodway Street	31	33	6
Hatchett Street	30	72	29
Frankfort Street	30	66	27
Ormond Street	29	76	12
Ward Street	29	77	49
Newtown Row	28	38	19
New Summer Street	27	70	52
Lower Tower Street	27	74	40
Cowper Street	25	40	28
Asylum Road	24	27	19
Summer Lane	23	46	14
Milton Street	22	66	18
Theodore Street	21	62	15
Geach Street	20	48	9
Paddington Street	17	31	3
Porchester Street	17	30	0

St. Mary's Ward.

Street.	Annual Death-rate in 10 years, 1888-1897.	Percentage of Houses without through ventilation.	Percentage of Houses rented at 3 6 or less.
Bagot Street	39	75	53
William Street North	36	70	17
Oxygen Street	36	61	84
Fisher Street	34	61	29
Brewery Street	33	52	35
Hanley Street	33	76	29
Princip Street	31	83	69
Cecil Street	29	70	41
Lister Street	29	45	26
Shadwell Street	28	57	55
Moland Street	27	66	53
Gosta Green	27	56	40
Mill Street	26	19	27
Cliveland Street	25	47	53
Canal Street	24	72	51
Coleshill Street	24	54	27
Woodcock Street	24	14	30
Aston Street	23	24	25
Legge Street	22	11	31
Vauxhall Street	22	62	41
Prospect Row	17	31	28

Death-rates in streets in St. Stephen's ward.

Do the figures for St. Stephen's ward bear out the above conclusions? It will be seen from the table opposite that they do so. In St. Stephen's the number of streets for which death-rates can be given is small, but there are four of them with death-rates of from 33 to 39 per 1,000, and four others with rates of from 17 to 21 per 1,000. St. Stephen's, therefore, is not wholly unhealthy, and its unhealthiness must be due to its condition, not to its situation, and must therefore be remediable.

The figures for St. Stephen's also show a high mortality in the streets in which there is a large number of houses with front ventilation only, and in a still more marked degree a terribly high death-rate in streets where the rents are very low.

Death-rates in streets in St. Mary's ward.

The death-rates in St. Mary's Ward are very similar to those in St. Bartholomew's and St. Stephen's. Six streets have rates of from 33 to 39 per 1,000, but only one has a rate of less than 21 per 1,000. It will be seen, however, that almost all the streets in the list for St. Mary's have either a large proportion of houses with front ventilation only, or a large number let at 3s. 6d. a week or less.

Influence of badly ventilated houses.

The influence of badly-ventilated houses will be better understood if the figures in the foregoing statements are summarised as follows :—

No. of Streets.	Death Rate.	Average Number of Houses without Through Ventilation.
6	Under 20 per 1,000	Under 38 per cent.
25	20 to 25 "	50 "
25	25 ,, 30 "	55 "
21	30 ,, 35 "	62 "
14	Over 35 "	65 "

Only the streets whose death-rates do not exceed 20 per 1,000 can be considered to be healthy, and in them the average proportion of houses with front ventilation only was but 32 per cent. Side by side with the increase in the death-rate in the other groups of streets there is a corresponding increase in the proportion of badly-ventilated houses.

These figures entirely confirm the view that deficiency of house ventilation is a notable factor in the production of high death-rates. If better ventilation were provided in houses with front ventilation only by the provision of doors and windows, either at the back or side, the mortality in such houses would doubtless be greatly reduced.

Influence of low rented houses.

The following statement indicates the effect on the death-rate of a large number of low-rented houses.

No. of Streets.	Death Rate.	Average Percentage of Houses Rented at 3/6 or less.
6 ...	Under 20 per 1,000 ...	13
25 ...	20 to 25 " ...	20
25 ...	25 " 30 " ...	34
21 ...	30 " 35 " ...	39
14 ...	Over 35 " ...	54

The presence of a large number of three and sixpenny houses evidently has a very marked effect on the death-rate, much more marked than the presence of houses with front ventilation only has by itself. But it must be remembered that the three and sixpenny houses are also houses with front ventilation only, and as a rule they are in bad condition, as well as poorly ventilated. It is not surprising, therefore, that their existence affects the death-rate in so marked a degree.

Deductions from enquiry into death-rates in streets.

The chief lessons to be learnt from the foregoing inquiry are as follows :—(1) That in certain streets in St. Bartholomew's, St. Stephen's, and St. Mary's wards, the death-rates are deplorably high. (2) That this is the result of their sanitary condition, not of their situation. (3) That generally speaking, the high death-rates are found in streets in which houses with front ventilation only are most common. (4) That where the latter houses are let at very low rents their influence on the death-rate is very pronounced.

Seeing how high the death-rates in these streets are, it is most desirable that all the sanitary measures which are now being carried out in the town should be pressed forward in them with greater dispatch than ever. The existence of such death-rates must be regarded as a call both to the Health Department and to the property owners in the city to neglect no single measure that may decrease the high mortality.

Particulars as to Barn Street.

It will be of interest before leaving this subject to give a few details respecting a particular street in which the death-rate is very high. Barn Street is one of these, and may serve as an example.

When the Sanitary Census was taken, Barn Street had in it 103 houses, of which no less than 86 had no back doors or windows, leaving only 17 in which there was through ventilation. A house in which there is no through ventilation is necessarily close and stuffy, often dark, and always detrimental to health. Ninety of the houses in Barn Street consisted of three rooms only, and fifty of them were let at 3s.6d. a week, or less.

For the 103 houses there were 63 pan-privies and 1 water-closet. Practically, the whole of the closet accommodation, therefore, was on the pan system — a system which is now entirely out of favour with sanitarians, and is being superseded by the water-carriage system wherever the property owners can be persuaded to make the alteration. Moreover, of the 63 pan-privies, 59 were built in groups of from two to nine privies in a group; thus the nuisance arising from them would be aggravated by their proximity to each other, as well as by the fact of their being common to several houses; for privies that are used in common are scarcely ever kept as clean as those that belong to separate households. Particulars as to Barn Street—*continued.*

The inmates of 25 of the front houses not having back doors have to walk along the street for a short distance and then pass down the entry and into the yard in order to reach the closets provided for them: a most objectionable arrangement on the grounds of comfort, of decency, and of health. A similar journey has to be taken in order to put refuse matters in the ashplace or down the drain, a condition of things which tempts people to allow such refuse to remain in the house, or to throw it on the surface of the street. Out of twelve back yards only seven were paved all over, and recent investigations, referred to in another part of this report, show how grave a danger exists in having unpaved and uncultivated ground in proximity to houses.

All the above points indicate that in Barn Street there are many insanitary conditions which ought to be removed, and no doubt the same is true of other streets in which the death-rate is very high. Until the mortality in these particular streets is greatly reduced it cannot be hoped that the general death-rate of the city will be brought down to a really satisfactory point.

INFECTIOUS DISEASES.

The seven principal zymotic diseases had 1,400 deaths set down to them, giving a zymotic death-rate of 2·8 per 1,000. In 1897 the zymotic death-rate had been 3·8, in 1896 it was 3·6, and in 1895 it was 2·7. On several occasions it has been as low as 2·0 per 1,000. Zymotic death-rate.

Scarlet fever, diphtheria, measles, and whooping cough all showed a considerable reduction on their average mortality, but typhoid fever and diarrhœa caused more deaths than usual, as will be seen from the following figures. Deaths from zymotic diseases.

	Deaths in 1898.	Average 1893-1897.	Increase or Decrease.
Smallpox...	0	51	– 51
Measles	182	244	– 62
Scarlet Fever	47	105	– 58
Diphtheria and Croup ...	132	168	– 36
Whooping Cough ...	256	265	– 9
Typhoid Fever	113	96	+ 17
Diarrhœa...	668	640	+ 28
Enteritis...	544	292	+252

The above figures are very satisfactory except in respect of typhoid fever, diarrhœa, and enteritis which seems to be commonly regarded as synonymous with diarrhœa.

Zymotic death-rates in great towns.

According to the Registrar-General there were 16 of the 33 great towns which had lower zymotic rates than Birmingham.

Smallpox.

Smallpox.

Not a single case of smallpox occurred during the year; indeed, it is now over two years since there has been a case of this disease in the city. Smallpox usually becomes violently epidemic about every tenth year and dies away in the intervals, but it is very exceptional for two years to pass by without the occurrence of a single case: in fact, it has never happened before in my experience as Medical Officer of Health for this city, which extends over a period of 26 years. If the disease follows its usual course a widespread epidemic may be expected in about five years.

Vaccination.

New Vaccination law.

By the Vaccination Act, 1898, several important modifications have been made in the law as to vaccination.

The period within which a child must be vaccinated has been increased from three to six months after birth.

If requested to do so, the Public Vaccinator must attend at the child's home in order to perform vaccination there.

If vaccination has not been performed within four months after birth, the Public Vaccinator will visit the home and offer to vaccinate the child with glycerinated calf lymph.

No parent will be prosecuted for failing to have a child vaccinated if within four months of the child's birth he

satisfies two justices or a stipendiary magistrate that he conscientiously believes that vaccination would be prejudicial to the health of the child.

In the case of a child born before the passing of the Act the conscientious objection must have been made within four months of such passing of the Act.

No person shall be prosecuted more than once for failing to have any particular child vaccinated.

Opinions vary greatly as to what the effect of the Act will be, and at present it is very difficult to forecast its influence.

Vaccination in Birmingham.

I have obtained, as usual, returns relating to the vaccination of children born between July, 1897, and June, 1898, which are printed in Table XIII. From these it appears that 78·0 per cent. of the surviving children had been vaccinated up to the time the returns were compiled. Conscientious objections to vaccination were made in respect of 37 out of the 17,081 children born. This is a very small number, and seems to show that the objection to vaccination is not very marked in Birmingham.

I hope this may prove to be the case, for any general neglect of vaccination is an evil that should be dreaded by all who have the health and prosperity of the town at heart, for experience has shown that where smallpox breaks out in a badly vaccinated community it is capable not only of causing a widespread mortality, but also of ruining for a time the commercial life of the place.

Measles.

Measles.

The deaths from measles were much below the average number, although they amounted to 182 or about four times as many as those from scarlet fever. Inasmuch as most of the deaths are really due to cold and not to the disease *per se*, the mortality from measles is both humiliating and deplorable.

Measles handbill.

Through the kindness of the School Board Officers, information was forwarded to me of 728 houses in which measles was present. To each of these houses a handbill was sent by post calling attention to the necessity of separating the patient from other children, taking precautions against a chill, and disinfecting the sick-room.

It is hardly possible to suppose that this pointed method of calling attention to the seriousness of the disease can fail to have a beneficial effect on the mortality from it.

Scarlet Fever.

Scarlet Fever.

The mortality from scarlet fever was unusually small, smaller indeed than in any year since 1888 and almost the smallest on record. The deaths numbered 47 and the cases 1,320. The number of cases was smaller than in any other year for which figures relating to scarlet fever cases are available, that is, since 1890.

During the year 1083 cases of scarlet fever were admitted to the City Hospital. No doubt the very large proportion of cases treated in hospital has greatly reduced the mortality from the disease.

All the houses in which scarlet fever occurred were disinfected, and also the bedding, clothing, carpets etc., from the sick-rooms.

Diphtheria.

Diphtheria.

In 1897 I reported that a substantial improvement had taken place in the prevalence and fatality of diphtheria and membranous croup. During 1898 a further marked improvement took place, as is shown by the following figures:—

	Cases Notified.	Deaths Registered.
1892 ...	533 ...	102
1893 ...	387 ...	83
1894 ...	406 ...	91
1895 ...	741 ...	214
1896 ...	1,194 ...	293
1897 ...	713 ...	160
1898 ...	689 ...	132

From this it would seem that the epidemic of the disease is gradually passing away.

Bacteriological Examinations.

During the year 220 specimens from the throats of persons suspected to be suffering from diphtheria were examined on behalf of your Committee at the Bacteriological Laboratory at Mason University College. Eighteen of the specimens were from patients for whom an examination had previously been made, the object of the second investigation being to determine whether the sufferer was now free from the disease germs. Thus the actual number of patients for whom bacteriological examinations were made was 202.

The diphtheria bacillus was found in 92 out of the 202 cases, proving that the patients were suffering from true diphtheria. In the other 110 instances the bacillus could not be discovered. It must not be assumed that all of the cases in which no bacillus was found were non-diphtheritic, because for various reasons it is sometimes impossible to

discover the disease germ, although there can be little doubt as to the nature of the illness. It may, however, be safely assumed that most of the cases which gave negative results were not diphtheria.

The work done for your Committee at the Mason University College Laboratory must therefore have been of considerable value to those medical practitioners who availed themselves of the advantage of a bacteriological examination to assist them in forming a diagnosis. Unfortunately, the number of such practitioners is not so large as could be wished.

Anti-toxin serum.

A supply of anti-toxin serum was sent to 164 patients. Of these, 74 had not had a bacteriological examination made, 83 were undoubted cases of diphtheria for the characteristic bacillus was found in them, and in the remaining seven instances it could not be discovered.

I have no doubt that the value of anti-toxin is very great. If it is to have its full effect, however, it must be used at the earliest possible moment. I greatly wish that all the medical men in the town would resort to its use as soon as they are convinced that they have a case of diphtheria to deal with.

Reduced fatality of Diphtheria.

The fatality of the disease during the last eighteen months appears to indicate that a real benefit has resulted from the gratuitous distribution of anti-toxin serum. This distribution came into force in June, 1897, and the case-mortality before and after then has been as follows :—

	Case-Mortality from Diphtheria and Croup.
1893	21 per cent.
1894	22 "
1895	29 "
1896	25 "
1897 (January to June)	25 "
1897 (July to December)	20 "
1898	19 "

It seems probable that a more prompt and general use of the serum would result in a further diminution in the fatality of the disease.

Need of hospital provision.

The need for providing hospital accommodation for diphtheria patients, to which attention was directed in my last Annual Report, continues to be strongly felt. I understand that there is hardly any provision made at either of the general hospitals, and there seems no doubt that if diphtheria patients in the poorer and more crowded parts of the town could be immediately removed to a hospital many lives would be saved and the spread of the disease would often be checked.

It may be of interest to mention that in 1897, the last year for which I have information at hand, 43 per cent. of the diphtheria cases were removed to isolation hospitals in London, 31 per cent. in Manchester, and 24 per cent. in Liverpool. From this it appears that Birmingham is behind other great towns in this matter.

Whooping Cough.

Whooping Cough.

This disease caused 256 deaths last year against a quinquennial average of 265. The mortality in the last five years has been as follows :—

	Deaths from Whooping Cough.
1894	219
1895	173
1896	386
1897	227
1898	256

These figures represent a very serious loss of life.

Whooping cough is often regarded much too lightly. No attempt is made to isolate the sufferer, and very little trouble is taken to prevent the occurrence of respiratory complications by which a fatal issue is brought about. Almost all the deaths occur in young children ; last year 104 were in infants under one year, 148 in children between one and five years, and only four in children over five years old.

More than 50 per cent. of the deaths occurred in houses of three rooms or less, and hardly any in houses of more than six rooms.

Typhoid Fever.

Typhoid Fever.

The figures relating to typhoid fever are far from satisfactory, being as follows :—

	Cases Notified.	Deaths Registered.
1892 ...	260 ...	39
1893 ...	489 ...	94
1894 ...	511 ...	105
1895 ...	436 ...	82
1896 ...	483 ...	108
1897 ...	533 ...	89
1898 ...	637 ...	113

Both as regards cases and deaths, the year was a bad one in respect of typhoid fever.

The following table shows the case rate per 1,000 persons living in each of the wards :— Typhoid Fever in wards.

	Case-Rate from Typhoid Fever.
St. Stephen's	2·7 per 1,000.
St. Bartholomew's	2·4 ,,
St. George's	1·9 ,,
St. Paul's	1·8 ,,
Ladywood	1·7 ,,
All Saints'	1·4 ,,
Rotton Park	1·4 ,,
Market Hall	1·3 ,,
St. Thomas's	1·1 ,,
Nechells	1·1 ,,
St. Martin's	1·1 ,,
Deritend	1·0 ,,
Saltley	1·0 ,,
Balsall Heath	0·9 ,,
St. Mary's	0·8 ,,
Duddeston	0·5 ,,
Bordesley	0·5 ,,
Edgbaston and Harborne	0·5 ,,

These figures show that there was considerable variation in the prevalence of typhoid fever in the different wards, but no ward had so high a case-rate as to indicate any severe local outbreak in a particular district, such as might arise from some general cause—a contaminated milk or water supply for instance.

On analysing the list of cases, I find that as many as 46 of them occurred in houses in which a previous case had been reported at least a fortnight earlier, so that in 46 instances, or one in every 14, the disease was clearly contracted from the previous patient in the same house. Presumably, in these cases the steps necessary to isolate the first patient and to disinfect the excreta were insufficient. If the first case had been promptly removed to a hospital, where alone proper isolation and disinfection would be carried out, presumably the succeeding cases would not have occurred. Need of hospital provision.

But the effect of treating a typhoid fever patient at home, and in the face of numerous difficulties, is not confined to the inmates of the same house. It extends to other persons also. Thus there were over 40 cases last year which were distinctly traceable to other recent cases, either in houses adjoining or amongst the patient's circle of friends.

Taking a very low computation, therefore, there were at least 86 cases directly due to infection from another case, or one seventh of the total number. If removal to hospital had taken place promptly in all cases where

Typhoid Fever —*continued.*

thorough isolation and disinfection could not be relied on, probably most, if not all, of these 86 cases would not have occurred.

An actual example or two may make the manner in which typhoid fever spreads more intelligible. The following is an instance in which a number of cases occurred in the same house, with considerable intervals between them :—

Sept. 21st	.. A. P., 10 ct., 4 h., Garrison Street	...	... Not removed.
Nov. 8th	... A. P., ,, ,,		... Removed.
,, 14th	... S. P., ,, ,,		... Not removed.
,, 25th	... S. P., ,, ,,		... Removed.

The long interval between the first and second cases in this house makes it reasonable to conclude that the latter cases would not have occurred if the first one had been removed at an early date, and the house had been disinfected. The incubation period of typhoid fever is from a week to a fortnight, so that the second case must have received the infection five or six weeks after the first case was notified. As a matter of fact, the first case was still lying ill in the house when the second and third cases were notified, and died six days before the fourth case was reported.

The following in an instance of the disease spreading to adjoining houses :—

Aug. 1st	... L. S., 5 ct., 8 h., Adderley Street	...	Not removed for 9 days.
,, 26th	... A. C., 55 ct., 6 h., Bell Barn Road	...	Not removed. Aunt to cases at 5 ct., 11 h., Adderley Street.
,, 29th	... J. W., 5 ct., 9 h., Adderley Street	...	Not removed for 3 weeks.
Sept. 14th	... T. N., 5 ct, 11 h, Adderley Street	...	Not removed for 10 days.
,, 17th	... B. N., ,, ,,	...	Not removed.
,, 17th	... R. N., ,, ,,	...	Not removed.
,, 17th	... G. N., ,, ,,	...	Not removed.
,, 29th	... A. T., 77, Adderley Street ...	...	Not removed. Adjoins 5 court.
Oct. 14th	... A. P., 109, Watery Lane ...	...	Not removed. Abuts on 5 ct., Adderley Street.
,, 15th	... C. B., 55 ct., 7 h., Bell Barn Road	...	Not removed. Waited on case at 55 ct, 6h., Bell Barn Road.
Nov. 1st	... L. H., 37, New Bond Street ...	...	Not removed. Came from 5 ct., Adderley Street, a fortnight ago.

In this instance it can hardly be doubted that prompt removal of the earlier cases would have prevented some, if not all, the later ones.

Removal to Hospital and lessened spread of infection.

During the last half of the year I made an enquiry as to which cases were removed to hospital, so that I might see whether secondary cases occurred or not. I found that

106 cases in which the first patient was removed produced only one secondary case. But in 199 cases where the first patient was treated at home no less than 19 secondary cases occurred. Typhoid Fever —*continued.*

This makes is quite clear that even the present imperfect, and often tardy, system of removing the patient to a hospital, or to a poor-law infirmary, is of great though limited value in preventing further cases in the household. No doubt it is also of equal value in preventing cases in other houses in the neighbourhood. A public hospital to which removal could take place at the earliest possible moment, and in a larger proportion of cases, would obviously be of infinitely greater value.

The argument in favour of removal to hospital is made much stronger by a study of the actual accommodation existing at the houses where typhoid fever occurred. They numbered 555; and 284, or more than half of them, consisted of three rooms only. In these three rooms, on an average, 5·1 persons had to live and sleep. In 1 of the three-roomed houses there were twelve inmates; in 2 others there were ten; in 10 others, nine; and in 23 others, eight inmates. It is quite evident that effective isolation is impossible where 8, 9, 10, and even 12, persons, have to live and sleep in three rooms. Imperfect isolation at home.

I have stated that in the whole of the houses invaded by typhoid fever the average number of inmates was 5·1 per house. But in the houses in which a second case occurred after a fortnight's interval the average number of inmates was 5·9 per house, and in those in which, after yet another fortnight a third case occurred it was 7·2. Thus the disease spread most widely where a large number of people lived in a small house.

All these facts constitute a very strong argument in favour of getting all cases of typhoid fever in small houses removed to hospital. This would be an advantage to the patient, whose chance of recovery would be greatly increased; it would be an advantage to the other members of the household, who would run much less risk of being infected; and an advantage to the general public, to whom the disease frequently becomes communicated when proper isolation and disinfection are not carried out. I earnestly hope that sufficient provision may be made at an early date for the removal of typhoid fever patients to hospital wherever their surroundings and circumstances make it desirable. Advantage of removal to hospital.

Recent investigations have indicated a very probable means by which typhoid fever may be spread, *i.e.*, through the medium of a polluted soil. Typhoid Fever and impure soil.

Typhoid Fever and impure soil.—*continued*

Dr. Sidney Martin, Medical Inspector to the Local Government Board, has conducted a number of experiments on various kinds of soil. Taking soil from localities where enteric fever is common, he first sterilized and then inoculated it with the typhoid bacillus, and testing it at varying intervals found that the microbe had not only retained its vitality but in some cases had spread from the point of infection throughout the whole mass of the soil, and in other cases throughout a portion of it.

Dr. Martin's experiments showed that in soils containing animal organic matter the typhoid bacillus when introduced after sterilization retained its activity for lengthy periods, in one experiment for 456 days after inoculation, and that in most cases it spread from the centre of the soil to the periphery. But virgin soils containing no animal matter, but in some cases containing large quantities of organic vegetable matter, were hostile to the life of the bacillus and all signs of vitality had disappeared in the course of two or three weeks.

Dr. Robertson, of Sheffield, has published the results of experiments made by him in 1896 and 1897. In May, 1896, he inoculated three patches of ordinary soil in a field; one inoculation was on the surface, one 9 inches below it and one 18 inches below it. In all of them the living typhoid bacilli were found to be present in August and again in October, three and five months later respectively. In November, however, the examinations gave negative results.

In August, 1896, three other patches were inoculated. In November they also gave negative results.

Subsequently Dr. Robertson began to water three of the six patches with dilute organic matter, and in June, 1897, samples were taken from all six patches. Those which had not been watered still gave negative results. Those that had been fed with organic liquids all revealed the presence of the living typhoid bacillus.

In the case of the cultures placed 18 inches below the surface it was found that the bacillus had spread from that point to the surface itself.

These experiments appear to show that in an impure soil the micro-organism of typhoid fever will live for a long time, that it may be quiescent for a considerable period and then take on renewed activity; and that this renewed activity is much more likely to take place if the soil receive foul water such as drainage, etc.

In speaking of the results of Dr. Sidney Martin's experiments, and the practical suggestions arising therefrom, Sir Richard Thorne, Medical Officer to the Local Government Board, used the following words :— Typhoid Fever and paving of yards.

"I would in the first place advocate the paving of open spaces about dwellings where these open spaces are of small area, and are liable to become contaminated with excreta. In this way fouling of, as well as penetration by a pathogenic micro-organism into, the underlying soil is practically prevented. Indeed, it is well known, not only that the paving of yards about small cottage and tenement property in towns has in its results been shown to be a public health measure of first importance, but also that the value of such a measure has depended largely on the use of a form of pavement which really ensures impermeability.

"In the next place, it will be clear that organic and decaying refuse should be so dealt with as to prevent its contaminating the soil in the neighbourhood either of dwellings or of sources of water supply. I need hardly point out here in detail what are the points to aim at in securing this end ; but I may perhaps usefully approach the matter from the other point of view, and say that the midden-privy which still prevails in so many of our large midland and northern towns presents every feature that should studiously be avoided. Generally sunk below the surface of the ground, often open to rainfall, always storing up decomposing excreta and refuse in close proximity to dwellings, it provides almost every condition favourable to the production of nuisance, to the saturation of soil with filth, and to the setting up and maintenance of those very conditions which seem to be essential to the vitality and multiplication of the typhoid bacillus. Typhoid Fever and ashpit privies.

"The fact that with our present knowledge such a structure as the common midden-privy should not only exist in our midst, but be clung to with a perverted tenacity, is in my opinion the greatest blot which attaches to English sanitary administration at the close of the nineteenth century. Apart from its sanitary aspect, it is a system as degrading and ignoble as it is foul, and I trust the day is not far distant when we shall look back to it as a barbarism of the past. Firstly, then, let our aim be to maintain such a condition of cleanliness about our houses that the soil shall approach as far as practicable to the condition of those virgin soils which are inimical to the growth of the pathogenic organism under consideration."

Typhoid Fever and ashpit privies—*continued.*

A most striking example of the danger of typhoid fever being spread through an ashpit-privy is recorded by Dr. Crocker, Medical Officer of Health for Eccles. In 1896, sixteen cases of typhoid fever occurred in nine houses in one street in that town. At each of these houses there was an ashpit-privy, and an order was made by the magistrates to substitute water-closets. The owner of five of the houses appealed to the Court of Quarter Sessions. It was stated that as soon as the first case was notified the pits were emptied and disinfected. Subsequently special pails containing disinfectants were used for receiving the excreta of the patients. At a later period a large quantity of chloride of lime was put in the pits.

The Medical Officer of Health held that the pits were likely to be still infected, and on October 22nd, 1897, thirteen months after the last case had occurred, he had two samples of filth scraped from between the bricks in two of the pits and forwarded to Professor Delépine, the well-known bacteriologist.

From one of these samples Professor Delépine obtained a *perfectly typical typhoid bacillus.*

In this case the pit was not used after the nature of the illness was known, it was emptied and disinfected, subsequently treated with chloride of lime, and yet, after more than a year's interval, a typical typhoid bacillus was found in it, showing that when typhoid fever occurs at a house where an ashpit-privy exists, it is impossible to avoid the gravest risk that the infection will be retained in the ashpit and privy in spite of every possible precaution. In the light of this example the weighty words of Sir Richard Thorne obtain even an added importance.

Diarrhœa.

Diarrhœa.

The figures relating to diarrhœa, although better than in 1897, are very unsatisfactory. No less than 668 deaths were set down to diarrhœa and 544 to enteritis, which for the most part must be taken as a synonym of diarrhœa. This makes a total of 1,212 deaths from diarrhœal diseases, or 280 in excess of the average number.

In my last Annual Report, I dealt at some length with the subject of diarrhœa, and made a number of suggestions with regard to it. I do not propose, in this report, to go into the subject very fully, but will recall some of the leading facts upon which preventive measures must be based.

Diarrhœa and soil.

Epidemic diarrhœa is apparently due to a micro-organism which inhabits the superficial layers of the ground. Where the ground consists of virgin soil it is probable that the microbe does not multiply, and under the influence of sunlight and alternating weather soon dies out. But if the soil is foul and the conditions of temperature and humidity are favourable, rapid multiplication takes place, till the soil becomes impregnated with the disease germs, which perhaps find their way into surface wells and cause diarrhœa through the water obtained therefrom.

Under the influence of certain physical changes, such as the rise and fall of ground water, the disease germs may be forced out of the ground and become air-borne and settle on food, particularly on milk In the wretched, little, dark, badly-ventilated pantries, opening on to a small unpaved yard, with refuse and excreta constantly stored in it, such a transference is easy, and no doubt very frequently takes place. The infected milk, or other food, is then capable of causing severe, and probably fatal, diarhœa.

Diarrhœa and paving of yards

In view of these facts, it becomes essential, where the space round a dwelling is small and consequently the soil can hardly fail to be polluted, that the surface of the ground be rendered impermeable. When this has been done, any germs already existing in the soil will be unable to reach the air, and will be innocuous. If the impervious surface is then kept clean and free from accumulations of organic filth of every kind, any germs deposited on it, being unable to gain access to the ground, will soon be destroyed by the action of the light and the alternations of temperature. Fresh air and sunlight are proved to be fatal to many kinds of disease germs.

Having these facts in mind, I made a number of recommendations last year to your Committee, with the object of diminishing the death-roll from diarrhœa. In respect to the paving and cleansing of small yards, and the better scavenging of privies, a great deal has been and is still being done. It is a most important work, and one which cannot be insisted on too strongly and too widely; but I consider it indispensable to successful results that the pavement laid down be of a really impermeable character. A certain number of pan and ashpit privies have been removed also, but the rate of progress in this direction is not satisfactory, and will not be so as long as the present difficulties in the way of conversion to water-closets continue.

Phthisis or Consumption.

Consumption.

This disease has, during the last few years, been the subject of much research, and, as a consequence, certain characteristics of the complaint are now generally accepted as indisputable which formerly were somewhat doubtful.

It is recognised that consumption is a communicable disease, and that it does not arise *de novo*; the infection is always transmitted from a previous case, either in man or in one of the lower animals. Hence it is very desirable that steps should be taken to restrict its spread, and eventually to stamp it out.

Consumption handbill.

At the request of your Committee, I drew up the following handbill on the prevention of consumption :—

Advice on the Prevention of Consumption.

Consumption is not inherited; but, like many other well-known diseases, it is caught.

It is properly called a preventable ailment, and yet it is one of the most fatal diseases, causing one death in every ten in England.

It is almost always caught either from a person who is suffering from the disease, or through infected air, milk, and possibly meat.

Some children are born with a constitution which strongly favours their catching Consumption, although it is not born with them. Such persons ought to be very careful to avoid exposure to the disease.

Intemperance, overcrowding, bad air, darkness, dampness, colds, sore throats, and many other diseases, make people liable to take Consumption, by weakening their constitutions.

Good health is the best protection against the disease.

Consumption is caused by a germ, which may also cause disease of other parts of the body besides the chest, such as the bowels, especially in children, who are often attacked if infected milk is used.

All milk should therefore be boiled, by which the germs are killed.

Every person suffering from Consumption is likely to give the disease to other persons, chiefly by means of the spit, which contains the germs.

Consumption handbill—*continued.*

As long as the spit is moist it will not do much harm. It is very dangerous when it has dried, as the dust, with its germs, can get into the air breathed.

Consumptive persons should never spit upon the floor, nor into a handkerchief which has to be put into the pocket or under the pillow. They should take care that no spit is smeared over their bed-clothes or night-dresses, or on their beards or moustaches.

A case of Consumption may be made almost harmless to other people by preventing the spit from drying and becoming dust.

The greatest care is necessary when in-doors. A consumptive person should use a spit cup, containing a little water or water and carbolic acid, or should spit into a rag or piece of paper, which can be burned at once.

When out-of-doors there is not so much danger, as the germs are killed by sunlight and fresh air. A special spit bottle, to be carried in the pocket, can be bought for a small sum; failing this, a consumptive person should spit over a street gulley or into the horse-road—never on the footpath nor in a tram-car, omnibus, cab, or railway carriage. It is better to spit on the ground than into a handkerchief.

If a handkerchief or any article of clothing has been soiled with spit, it should be kept wet till it can be boiled and washed.

The contents of the spit cup or spit bottle should be emptied down a water-closet or drain, or on to a fire, and the bottle or cup should be cleaned with boiling water, with or without a disinfectant.

No spoon, cup or other article which has touched the mouth of a consumptive person should be used by anyone else until it has been carefully washed.

Food which has been left by a consumptive should not be eaten by a healthy person.

No one who is consumptive ought to kiss or be kissed except on the cheek or forehead.

No mother who is consumptive should suckle a baby.

All persons who are consumptive ought to have beds to themselves.

Sunlight and fresh air are the very best disinfectants; they should be used very freely.

Consumption handbill—*continued.*

In cleaning rooms, damp dusters should be used, and wet tea-leaves or sawdust should be put down before sweeping, so that the dust will be removed without being spread through the air. The dusters should be boiled, and the sawdust or tea-leaves burned.

After the death of a consumptive person it is necessary that washing and disinfection should be thoroughly carried out. The disinfection of the room will be done by the Health Department, on notice being sent to the Medical Officer of Health.

N.B.—*Consumption cannot be caught from the breath or the skin. If the above precautions are taken, there is no danger from living with, or being in the company of, persons who are suffering from it.*

ALFRED HILL, M.D.,
Medical Officer of Health.

Health Department,
Council House,
Birmingham.
October, 1898.

Fifty thousand copies of the above circular were printed, and the greater number of them have been distributed. It is hoped that by this step a more accurate knowledge of the behaviour of the disease, from a public health standpoint, will be disseminated throughout all classes in the town, and that stricter precautions will be taken against the spread of the infection.

It would be a great help if medical men, nurses, district visitors, and others, who hear of cases of consumption in various parts of the town, would place a copy of the circular in the hands of the patients' friends. Copies can be obtained on application at this office.

The response to an appeal for assistance in distributing the handbills has been very gratifying, and the thanks of your Committee are due to the numerous religious, philanthropic, scholastic, registration and other agencies that have taken up the matter with so much interest.

DISINFECTION.

Disinfection of houses by chlorine.

During the year I reported to you that recent investigations as to the germicidal properties of various disinfectants had considerably modified the views held regarding the desirability of relying upon disinfection by sulphur fumes. After careful consideration as to the various agents suggested, I came to the conclusion that the most suitable for the dis-

infection of walls, ceilings, and floors was a 1 per cent. solution of chlorinated lime. I recommended that the latter be employed in future in place of Sulphur, and that a special officer be appointed to carry out the process of house disinfection. Up till the time I reported this, disinfection of houses was done by the assistant inspectors, whose time was so fully occupied that I considered it most desirable that they should be relieved of this branch of their work, in order that they might be able to give more time to their other duties. I believed also that the use of chlorine would be found much cheaper than that of sulphur, and that the saving in the cost of the materials used would largely reduce the expense of engaging an additional officer. Disinfection of houses—*continued.*

In compliance with the above recommendation, a special disinfector was appointed, and instructed as to the use of the new disinfectant. I have every reason to believe that the result has fully justified the alteration made, and that the use of chlorinated lime has been much more effective in stopping the spread of the infection than the sulphur fumes had been. During the year 1,114 houses were disinfected, either with sulphur or chlorinated lime. Such of the contents of the houses as could not be purified at home were sent to the Disinfecting Station. These included 2,206 beds and mattresses, 3,448 sheets, blankets, and counterpanes, 3,216 pillows and bolsters, 4,708 garments, 207 carpets, and 720 miscellaneous articles. Disinfection of bedding, &c., by steam.

STAFF OF HEALTH DEPARTMENT.

I have already stated that during the year the work of disinfecting rooms was transferred from the Assistant Inspectors to a special officer, by which the work of the Assistant Inspectors has been to some extent modified. It would, however, be a great advantage if a larger Staff could be maintained, the present number of Inspectors being quite unable to get over their districts in a reasonably short time. Staff of Health Department.

Another change was made during the year by the promotion of one of the Assistant Inspectors to the newly-created position of Chief Assistant Inspector, and the engagement of a new officer to take charge of his district. By this alteration an addition of one was made to the Staff of Inspectors. Chief Assistant Inspector.

An important departure made during the year was the engagement of a staff of cleansers, to which reference is made on page 41. Cleansing Staff

Health Visitors.

The step your Committee are now taking in appointing four Women Health Visitors is one which will further improve the staff of the Health Department.

In November last I reported to you on the results of enquiries I had made in four of the towns where Health Visitors are already at work, the towns selected being Manchester, Liverpool, Glasgow, and Chesterfield. After giving details respecting the work done in the individual towns, my report went on to say that "the duties performed by the Health Visitors in the towns mentioned may be summarised as follows:—

"To visit systematically every house in a specially selected district.

"To pay repeat visits where necessary.

"To visit all houses at which a birth has taken place.

"To distribute and explain a leaflet giving minute instructions as to the feeding and care of infants.

"To make a special enquiry into all deaths under one year of age.

"To report cases to the 'Society for the Prevention of Cruelty to Children.'

"To distribute and explain leaflets as to Diarrhœa, Measles, Whooping Cough, and Consumption.

"To speak to tenants as to cleaning the house, washing their clothes, destroying refuse, and ventilating rooms.

"To sell or give away Carbolic Soap for cleaning rooms.

"To give away lime and lend brushes to persons who will limewash their rooms, yards, and outbuildings.

"To give away disinfecting powder, and explain its use.

"To help in nursing sick people, and to get them removed to hospital if possible.

"To lend maternity bags, sheets, pillow-cases, and night-dresses to sick people.

"To obtain certain particulars respecting every death for the Medical Officer of Health.

"To report all nuisances and sanitary defects to the Inspector of Nuisances.

Health Visitors—*continued.*

"It will be obvious from this summary that the work of the women health visitors is very extensive and of the utmost importance. It has five features which specially commend themselves to me.

"(i.) It is directed to the poorest parts of the town only. I have more than once pointed out that these are the parts in which terribly high death-rates occur, and until such death-rates are reduced, no material improvement in the general death-rate of the town can be expected. The appointment of Health Visitors would, I believe, tend to reduce such death-rates.

"(ii.) It embraces a vast amount of systematic inspection of houses, which at present is very imperfect, and the consequent discovery of a very large number of insanitary conditions which at present remain unknown.

"(iii.) It is specially intended to increase cleanliness, which is at the root of all true sanitation.

"(iv.) It affords a means of educating the poor as to the feeding of infants and care of the sick, and would no doubt reduce the very high infantile death-rate.

"(v.) It allows an opportunity of explaining leaflets issued by the Health Department, which I am afraid are at present little read, and still less acted upon by the class who need them most.

"It seems to me that such work must be of great educational value, and must exert a most beneficial influence on the health of the community."

At present it is not proposed that the work of the Health Visitors in Birmingham should embrace the whole of the points referred to in the foregoing summary. The duties will be principally confined to house-to-house visitation in the worst parts of the town, with the object of inculcating cleanliness in respect to the house, the sanitary conveniences and the yard; pointing out the advantage of free ventilation and the danger of bad smells; giving advice on the bringing up of children and the nursing of the sick; distributing and explaining leaflets on infectious diseases; and helping in every way in their power to make the homes of the people they visit more comfortable and more healthy. They will also report any sanitary defects they meet with, and in this way many insanitary conditions, which at present remain undetected, will be brought to light and remedied.

DWELLING HOUSES.

Houses with through ventilation.

The sanitary census taken at the beginning of the year showed that there were about 105,000 dwelling-houses in the city at that time. Of this number 63,000 had through ventilation; that is, they had an open space of greater or less extent both in front and at the back of the house. This, from a hygienic standpoint, is an immense advantage, inasmuch as the air in such houses is of necessity subject to a considerable amount of movement and cannot therefore become as foul as the more stagnant air of back-to-back houses.

Houses with front and side ventilation.

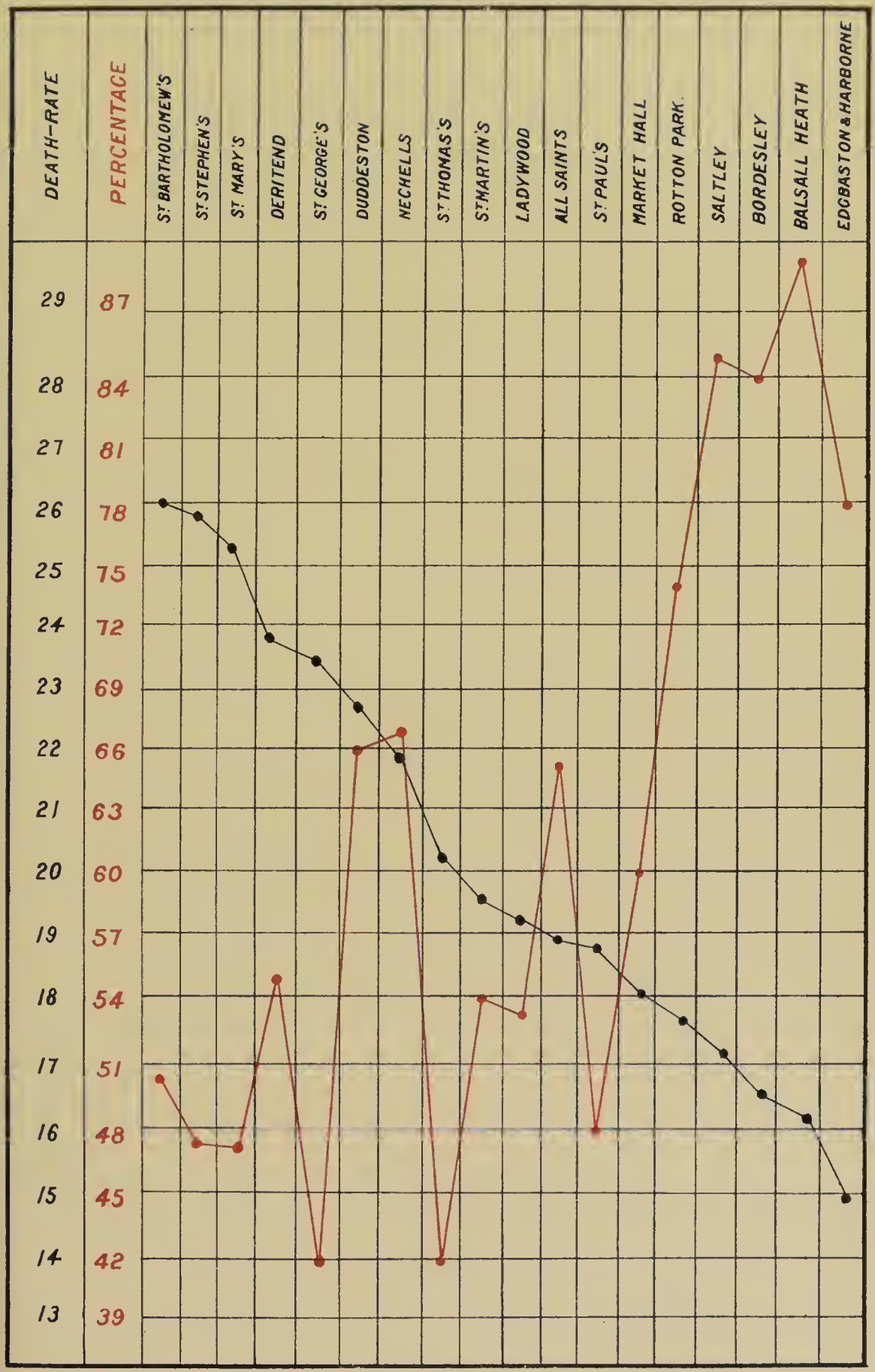
There were also 5,000 houses which had an open space on one side only, but had a side-door into an entry. This, of course, means much less efficient ventilation than obtains in the through houses, but a little better ventilation than is possible in the houses with front ventilation only. The houses with front and side ventilation are also superior to many of those with front ventilation only in another particular. They almost all open directly into the street, whereas the others often open into a court or terrace, where the air is less pure than in a public thoroughfare, owing to the yard being more or less confined, and to the presence in it of the privies and ashplaces.

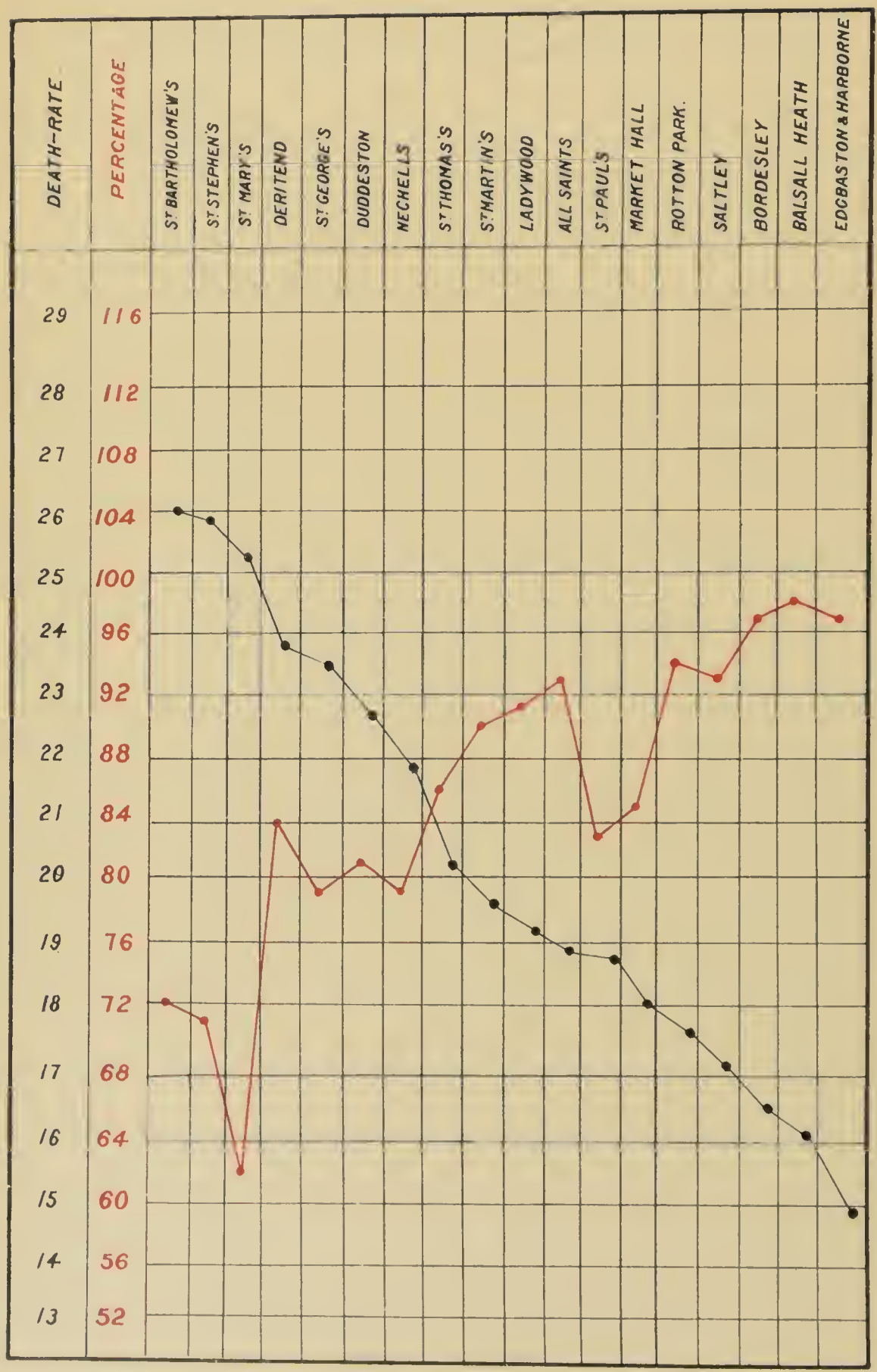
Houses with front ventilation only.

The houses with front ventilation only, numbered over 36,000, or about one-third of the total number of houses in the town. In towns, at any rate, such houses are well known to be, by virtue of their construction, far from healthy, and the fact that one-third of the house accommodation consists of these badly-designed dwellings, greatly militates against any efforts to improve the death-rate.

Effect of deficient ventilation on death-rate.

In order to show that the houses which have good ventilation have the effect of lowering the mortality of the districts they are in, I have prepared the chart on the opposite page. The black line on it represents the death-rate in the last five years in the various wards; the red line shows the proportion of houses with either front and back or front and side doors. Of course, there are other influences at work besides that of good or bad ventilation; but it will be seen that the death-rate falls as the proportion of houses with through ventilation increases. Thus in the five wards which have the highest death-rates, the proportion of well-ventilated houses is only 50, 47, 47, 55, and 42 per cent., but in the five wards with the lowest death-rates it is as much as 78, 89, 84, 85, and 71 per cent. If it were possible to alter the front-ventilation houses in such a way as to give them


DEATH-RATE
PERCENTAGE
St BARTHOLOMEW'S
St STEPHEN'S
St MARY'S
DERITEND
St GEORGE'S
DUDDESTON
NECHELLS
St THOMAS'S
St MARTIN'S
LADYWOOD
ALL SAINTS
St PAUL'S
MARKET HALL
ROTTON PARK
SALTLEY
BORDESLEY
BALSALL HEATH
EDGBASTON & HARBORNE
29 87
28 84
27 81
26 78
25 75
24 72
23 69
22 66
21 63
20 60
19 57
18 54
17 51
16 48
15 45
14 42
13 39
DEATH-RATE PER 1,000
PERCENTAGE OF HOUSES WITH THROUGH VENTILATION.



DEATH RATE PER 1.000 ——

PERCENTAGE OF HOUSES AT MORE THAN 3/6 PER WEEK. ——

either windows and doors at the back or side as well as the front, there is little doubt that their healthiness would be greatly increased. Such alterations could, of course, be carried out, but would be expensive.

There can be no doubt, however, that the healthiness even of the front-ventilation houses varies greatly, the variation being due to their condition. That is to say, if we have two front-ventilation houses, one clean and dry, with a good, paved yard, proper water-closet, and ashplace, and efficient drainage, the other with dirty, damp walls and floors, an ashpit or pan privy in an unpaved yard, and defectively-trapped drains, the former will be much healthier than the latter.

Effect of low rented houses on death-rate.

In any particular district, the rental of a front-ventilation house will be a valuable index as to whether it is a good or a bad specimen of that class of house. If the rental is very low the house will usually be found to be in bad condition.

Bearing this in mind, I have prepared another chart, which is reproduced on the opposite page. On this the black line again represents the death-rate, but the red line indicates the percentage of houses let at more than 3/6 a week, which will include practically the whole of the through ventilation houses and also the best of the houses with front ventilation only. It will be seen that as the proportion of better class houses increases so the death-rate falls.

This chart shows a much more regular relation between the black and red lines than the former one, the death-rate falling in fairly direct proportion to the increase in the number of better-class houses. From this it must be inferred that the house being kept in good condition is of even far more importance than its being of a good form of construction. That is to say a front ventilation house, if in a thoroughly good state, will not be so markedly unhealthy; but if neglected, so that it will only command a very low rental, it will affect in a conspicuous manner the health of the tenants.

The knowledge that the three-and-sixpenny houses are the haunts of an excessive mortality will be of great utility, inasmuch as it can be used in determining what properties in the town are likely to be in need of special attention. In allocating the Health Visitors, for instance, it will now be advisable to place them in neighbourhoods where such houses abound.

It must be borne in mind that the low-rented houses to which I am referring are occupied chiefly by the very poorest part of the population of the City, and that the poverty of the inmates contributes to make them unfit to battle with the insanitary condition of the dwellings in which by their circumstances they are compelled to live.

Need of more small houses.

From commercial and social causes the number of very low-rented houses is constantly decreasing, the sites occupied being taken up for business purposes. But unfortunately the houses taken down are not being replaced by others at a similar rental. I do not know of a single three-and-sixpenny house having been built in the last ten years. The number of such houses has consequently become far too small, and in many cases poor people are living in unsuitable houses simply because they cannot find accommodation elsewhere.

This being so, it is most desirable that a large number of very small cheap houses should be erected at once, either by the City Council or by some philanthropic or semi-philanthropic body. In the more northerly part of St. Stephen's ward, a ward with a vast amount of insanitary property and a terribly high death-rate, there is room for some hundreds of houses, and my statistics show that the houses erected in that district some ten years ago are quite healthy, and therefore that any houses to be erected in future will be the same if properly built, although the Ward has at present such a bad reputation.

Houses unfit for habitation.

During the year I represented to you, in conformity with the provisions of the Housing of the Working Classes Act, 61 houses as quite unfit for habitation. These were houses of the class I have been speaking of, all but three having front ventilation only, and all but five being let at less than 3/6. The actual rentals were as follows:—

5	houses at	more than 3/6
15	,,	3/- to 3/6
37	,,	2/6 to 3/-
4	,,	2/- to 2/6

These figures bear out the statement that it is the very low-rented houses which are so dangerous to health.

Of the houses represented only seven were closed, and in these cases the owners shut them up without an order from the magistrates. Nineteen houses were put in fairly satisfactory repair, and are now occupied again. One other has been demolished, and the remaining 34 are still under consideration.

During the year I made an Official Representation under Part I. of the "Housing of the Working Classes Act, 1890," of an unhealthy area in the City. Representation of unhealthy area.

In pursuance of Official Representations, two made in 1875 and one in 1893, two attempts have already been made to raise the health of the town by the opening out and reconstruction of unhealthy areas.

The first and largest scheme, the consequence of two Representations which I had the honour to make under the provisions of 'The Artizans' and Labourers' Dwellings Improvement Act, 1875,' and resulting in the formation of Corporation Street and other streets contiguous to it, has had a most distinctly beneficial influence on the health of the area concerned.

More recently the Milk Street Scheme, formulated under the provisions of "The Housing of the Working Classes Act, 1890," has relieved a congested and insanitary area, but has not yet been carried beyond the stage of demolition of buildings and clearance of the site. The removal of the old crowded structures is, however, in itself an advantage, and with a new and better system of buildings to follow a decided improvement must inevitably result.

It is not difficult to find in the City a considerable number of other areas requiring like treatment, but the work is one which from its magnitude and costliness is necessarily to be undertaken by instalments. The area represented last year measures a little more than three acres; the number of houses upon it, not including workshops and smaller outbuildings, is 223; and it has a population of 917, equal to an average of 4·1 persons per house. It cannot, therefore, be said that the houses are overcrowded by tenants, the number in each house being fractionally less than on the Milk Street area, as well as less than in the City as a whole. There is, moreover, a considerable amount of space in the courts, the value of which is, however, greatly lessened by the faulty construction and disposition of the houses and other buildings.

The two hundred and twenty-three houses comprise 99 front houses and 124 back houses. Of these 124 back houses, 117 are only approachable by narrow tunnel entries, and have, therefore, no free circulation of air in proximity to them. Moreover a very large number of them have privies, wash-houses, workshops, and even dwelling houses

Representation of unhealthy area—*continued.*

within a few yards of their doors and windows, by which the access of fresh air is further impeded. Not one of these back houses has through ventilation, almost all of them being back-to-back with other houses. Their construction, therefore, makes them traps for bad air, and renders ventilation in the proper sense of the word impossible. In addition to the 124 back houses, there are 37 front houses which have no through ventilation. In many of the houses there are rooms which have not even a fire-place and chimney to act as an outlet for the impure air.

The necessity for more space in the courts and yards on the area is greatly increased by the presence of a large number of pan privies necessarily situated so close to the houses that their effluvia are a serious nuisance and injury to health. There are 54 such privies built in 21 blocks, consisting of from 2 to 8 privies to a block. Almost all the privies are within 12 feet of the nearest dwelling houses. A considerable number of the court surfaces are partly unpaved, leading to the accumulation of solid and liquid filth, and rendering the process of cleansing very difficult if not impossible. The houses are, in many cases, dark, dirty, and in bad repair; many of them have defective roofs and spouting leading to dampness; and what is still more serious, the walls are commonly damp from absorption of ground water resulting from the absence of a damp-course. For the same reason—absorption of moisture from the ground—many of the floors, nearly all formed of quarries, are damp, due to the quarries being laid on the ground instead of on some waterproof material such as cement.

The rents of the houses in the courts vary from 2s. 6d. to 4s. 6d., a great majority being between 2s. 9d. and 3s. 9d. The total rental of the houses on the area is about £50 per week.

The annual Death-rate on the area, calculated on the deaths for the three years 1895, 1896 and 1897, is 38·2, but in the whole city there is one death in institutions to every five that occur at home, so that the total mortality amongst the population living on the area was probably about 45·8 per 1,000 per annum, *i.e.*, one-fifth more than the figure just given. It is worthy of note that while the Death-rate in the front houses with their better arrangement and larger adjacent space was 30·6, that of the back houses was 43·5, or 42 per cent. higher. A good conception of the unhealthiness of this district is obtained by comparing its Death-rate of 45·8 per 1,000 with the Death-rate of the whole city for the same

period, which was 20·5. If it be compared with the healthiest ward in the town—Edgbaston and Harborne, whose Death-rate was only 14·4—its excessive mortality becomes still more striking. Representation of unhealthy area—*continued.*

From a review of the above facts, I formed the opinion that the conditions described, viz. :—

Crowded and faulty grouping of the buildings on the area,

Back-to-back arrangement of most of the houses, which, in many instances, are damp, dark, dilapidated and ill-ventilated,

Pan-privies too close to dwelling houses,

Unpaved surfaces of courts, or defective pavement, with long, narrow entries to the courts impeding free movement of air

constituted it an unhealthy area. This opinion was borne out by the facts stated above as to its death-rate.

I therefore made an Official Representation in accordance with the provisions of Part I of 'The Housing of the Working Classes Act, 1890,' to the effect that the area in question is an Unhealthy Area, and this representation is now under consideration by the Improvement Committee, to whom it was made.

In addition to the above houses, I also inspected a large number of houses which were not in quite such bad condition as those just alluded to, and which I did not report as needing to be dealt with under 'The Housing of the Working Classes Act,' because it seemed better to serve notices for their repair under the "Public Health Act, 1875," in the ordinary manner. Unhealthy houses.

In the general routine work of the Department it was found necessary to cause 1,158 houses to be cleansed, and 1,353 to be repaired. Better ventilation was provided in 39 instances, overcrowding was remedied in 80, and water was removed from the cellar in 241 instances, and spouting repaired in 217. These improvements are of course very valuable in the interests of the health of the particular tenants whose houses were affected by them, and must also influence the general healthiness of the town.

CLOSET ACCOMMODATION.

Water-closets

The Sanitary Census showed that at the beginning of the year there were over 55,900 water closets in the town, of which 43,500 were at dwelling houses and 12,400 at other premises.

Pan privies.

The number of pan privies was over 31,300, 28,800 beingfor houses and 2,400 for other premises. This large number of pan privies constitutes a standing and a serious danger to the public health.

Ashpit privies.

There were also over 7,800 ashpit privies, 7,500 for houses and 300 for other premises. These privies were connected with 5,900 midden ashpits, many of the ashpits having several privies in communication with them.

Effect of closet accommodation on death-rate.

The fact that the death-rate is lowest in the parts of the town where water closets are most common is shown by the chart on the opposite page. On it the black line indicates the death-rate and the red line the proportion of water closets to houses. A glance at the chart shows that where the proportion of water closets is small the death-rate is high and where the death-rate is lowest the proportion of water closets is largest. From this it must be inferred that the conversion of the pan and ashpit privies into water closets would produce a material improvement in the health of the town.

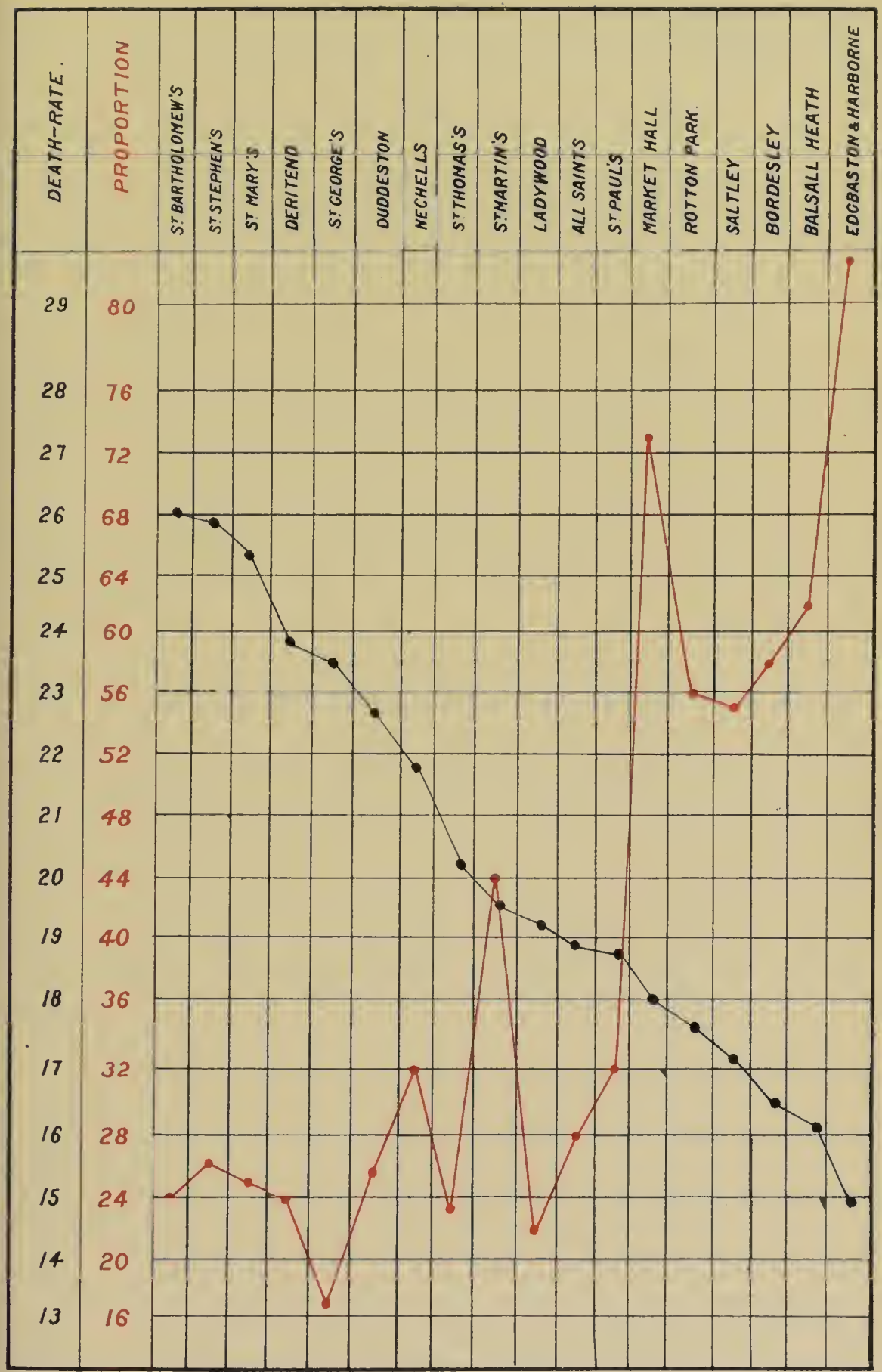
Privies converted.

Bearing this in mind, I am glad to find that the number of privies converted to water closets was unusually large last year. The figures for the last few years have been as follows :—

	Pan Privies converted to Water Closets.	Ashpit Privies converted to Water Closets.
1894	119	905
1895	248	1,122
1896	213	843
1897	105	768
1898	210	1,458

As regards the ashpit privies the number converted was large, being nearly one-fifth of the total number in existence. Such privies are now very generally disliked by the public, and hence it is not so difficult as formerly to get them converted.

Nevertheless, it was necessary for me to attend at the Police Court on several occasions to give evidence in support of legal proceedings instituted against persons who refused to make the required change.



DEATH-RATE PER 1,000. ——

PROPORTION OF WATER-CLOSETS TO 100 HOUSES ——

Some of the dangers arising from ashpit privies have already been alluded to in the part of my report dealing with Typhoid Fever, and the opinion of Sir Richard Thorne, the highest official authority on sanitary matters, has been quoted (see page 25). It need only be said here that it is most desirable that the rate at which ashpit privies are abolished should not be allowed to decline; indeed, if it can be accelerated by any means it should be done.

As regards the pan-privies, the number converted was comparatively small, being only 1 out of every 150 existing in the city; in other words, if the same rate of progress is maintained but not increased, it will take 150 years to rid the town of the pan-privies, which are almost, if not quite, as dangerous to health as the ashpit privies.

For this reason, it is most desirable that some scheme should be adopted by which the rapid removal of the pan system and the substitution of the water-closet system would be effected.

Cleansing of pan privies

As long as the pan-privies exist, however, it is imperative that they be kept as free from nuisance as is possible. During the year much was done in this direction.

In February, a staff of cleansers was organised consisting at first of four men and a foreman; in May, the number of men was increased to 10; and in June to 24. In September, after the hot weather was over, the number was reduced to 12.

At first these men were engaged in cleansing court surfaces which the tenants refused to keep clean; the cost being recovered, as far as possible, from the tenants. Subsequently they were very largely employed in cleansing pan-privies and ashplaces, and the work they have done in this direction must be of immense value.

The plan adopted is as follows:—In each case the pan is removed from its place, and the refuse which has accumulated round it is brushed or shovelled out. The space is then washed with buckets of water and a broom, and deodorised, after which the pan is put back in its place. The tenants are then expected to cleanse the seat if it requires cleansing.

Cleansing of ash sheds, &c.

Where there are ash-tubs, they are taken out and the refuse in the shed is swept up and placed in the tubs, disinfecting powder being thrown on the floor of the shed. Urinals and passages are treated in a similar manner. Efforts are being made to get ash-tubs provided at all places

where there are pan privies, so that the ashplace can be properly cleansed out from time to time.

During the year, 72,867 privies and 9,348 ashplaces were treated in the manner indicated above.

Limewashing of closets, &c.

In addition to this, 1,667 closets and privies, 571 ashplaces, 87 urinals, 29 washhouses, and 134 passages were limewashed by the cleansing staff at the request of the landlords, and at their expense, and 1,504 closets and privies were similarly treated under notices from the Inspector of Nuisances.

Repairing of privies.

As many as 555 water closets, 379 pan privies, and 202 tubsheds were found to be defective and were repaired. Notices are not served to repair ashpit privies; wherever they are found to be defective the owners are ordered to convert them to water closets.

There can be no doubt that during the year the condition of the pan privies has been much improved, and the nuisance arising from them has been considerably mitigated. It is very desirable that the systematic cleansing of both privies and ashplaces should continue to receive every attention.

COURTS AND YARDS.

Cleansing of courts.

Considerable advance has also been made in the condition of the courts and back yards. The plan followed with regard to cleanliness was to serve notice on the tenants to cleanse the yard. If this was not done, the cleansing staff did the work, using buckets and brooms, and collecting the cost from the tenants. In some cases arrangements have been made for courts to be cleansed once a week by the staff, and for the landlord and tenants to share the expense. During the year 1,442 courts were cleansed by the cleansing staff.

Paving of courts and yards.

But it is impossible to really cleanse the yards in which the surface is unpaved, and these are the very yards where filth is the most dangerous. It is therefore essential that all yard surfaces should be made actually impervious by being properly paved. During the year 403 yards had new pavement laid down in them, and in 387 others the pavement was repaired.

Importance of yard paving.

The importance of yard paving in towns is becoming more universally realised and has been referred to under the heading "Typhoid Fever." It is proved that the germ of typhoid fever can live for a very long period in an

impure soil; there is strong evidence that the micro-organism on which diarrhœa depends can do the same; and very possibly the germs of scarlet fever and other diseases find a breeding ground in the surfaces of the small, badly lighted and deficiently ventilated back yards in great towns. It is now recognised as essential that such surfaces must be rendered impervious so that no more disease germs can obtain an entrance into them, and any that are there already will be prevented from being forced out into the air again, there to become a danger. Such germs as may be deposited on the impervious surface will under the action of sunlight and temperature soon perish instead of multiplying.

Considering the great importance of this work it is gratifying to find that so large a number of yards were paved last year. I trust that this work will be continued and that your Committee will insist on the pavement being really impermeable. The work of yard paving is in the opinion of the best experts in sanitary science of utmost importance, but of little use unless properly done.

Keeping of animals.

The keeping of animals in proximity to houses is a most objectionable practice, and I am glad to find that 499 lots of pigs or fowls were removed last year at the instance of your officers.

DRAINAGE.

Drains put in order.

A large amount of work is always necessary if the private drains in the town are to be kept in good order. Last year 3,405 drains were opened and cleansed, and 1,312 were efficiently trapped. Additional drains were provided in 145 instances, drains were removed from cellars in 54 cases, and sink pipes were disconnected from the drains in 93 instances.

It is very important that the drains should be kept in good order. If they do not carry off the foul water but allow it to accumulate, the nuisance is obvious. If the traps are defective the escape of drain-air may prove very dangerous, even though scarcely perceptible. If the drain is defectively constructed and leaks, it fouls the ground around and may lead to many of the dangers already alluded to in connection with an impure soil.

Complaints of sewer openings.

I received during the year a considerable number of complaints of offensive smells from sewer openings in different parts of the town; these I handed to the City Surveyor, who took such steps as were possible to obviate any nuisance.

LODGING HOUSES.

Lodging Houses.

The number of lodging houses in Birmingham is only small. There are now 77 registered common lodging houses, accommodating 2,218 lodgers, the number of houses being two less than in 1897. There are also 77 houses registered as let in lodgings, or three less than in the previous year. They provide accommodation for 438 persons.

During the year, 12,275 visits were paid to the above houses by day and 962 by night. Very few serious offences were discovered, only three prosecutions being necessary during the year.

CANAL BOATS.

Canal Boats.

The number of boats on the register at the end of the year was 376. This is 12 more than in 1897, 26 boats having been registered during the year and 14 certificates having been cancelled.

The number of inspections made was 804. As a result five boats had to be put in a habitable condition, 12 cases of overcrowding and 7 of mixing of the sexes were remedied, 11 boats were provided with proper vessels for holding drinking water, and various other improvements were carried out.

WORKSHOPS.

Workshops.

The visits to workshops numbered 7,061. In connection with them a large amount of work was done which must have greatly improved their condition. Much of the work done will, undoubtedly, add permanently to the comfort of the workers. For instance, 132 additional water-closets and 26 urinals were provided, 48 midden ashpits were abolished and water-closets put in place of the privies attached to them, 27 pan privies were converted to water-closets, and 50 water-closets which had got out of order were repaired. To improve their cleanliness 688 workshops were limewashed, 32 others were repaired, 35 were more effectively ventilated, and 8 were made more healthy by a reduction of the number of occupants.

I look upon all steps taken to improve the healthiness of workplaces as highly important, because many of the workers have to spend at least one-third of their whole time there. It is, therefore, quite as necessary for the workplace as for the home to be made as sanitary as possible.

DAIRIES, COWSHEDS AND MILKSHOPS.

Dairies, Cowsheds, and Milkshops.

The great importance of milk as an article of diet makes it imperative that the places where it is stored and sold should be maintained in a cleanly and sanitary condition. It is the duty of a special officer to supervise them, and in the case of the cowsheds he is aided by the Assistant Inspectors for the various districts. Last year 159 visits were paid to dairies, 2,024 to cowsheds, and 4,389 to milkshops and stores. As a rule they were in good order, but in 121 instances either the shop, cellar, or pantry, where milk was kept, had to be limewashed; in 77 instances the sale of oil, tripe, fish or pickles was stopped, and in 12 instances the proprietors had to be cautioned as to not keeping the milk vessels clean. During the latter part of the year the Inspector examined a large number of churns as they were delivered at the railway stations, and in 31 cases he found them to be dirty.

In 28 instances a case of infectious disease occurred at a milk dealer's, and the business was either given up for a time or removed to other premises.

During the year, 154 applications to be placed on the milkshop register were received. Of these, 22 were refused owing to the unsuitability of the premises. Two persons were registered as dairymen, 4 as cowkeepers, and 5 as purveyors of milk.

BAKEHOUSES.

Bakehouses.

The number of bakehouses in the City is 517, and 1,067 visits were paid to them. Several old and badly constructed bakehouses were either demolished or taken down and rebuilt. Sixty were ordered to be limewashed. In a few instances animals were found to be kept either within or too near the bakehouse, and they were removed.

SLAUGHTERHOUSES.

Slaughterhouses.

These are inspected by the officers of the Markets Department under the direction of Mr. F. H. Edwards, Superintendent of Markets. He informs me that 15,367 visits were paid to them last year. One person was summoned for breaking the bye-laws and fined £2. Only 13 slaughterhouses had to be ordered to be cleansed.

At the request of the Markets and Fairs Committee, I inspected a building in Ledsam Street which had formerly been used as a slaughterhouse, and for which a license was again desired. It was situated in a very populous district, the entrance to the premises was by a narrow entry, the yard was very small, narrow, and ill-shaped, and had the back door of a house opening into it. In every way, therefore, the building was quite unsuitable for a slaughter-house, and I recommended that the license be refused.

UNWHOLESOME FOOD.

Unwholesome Food.

The returns submitted by Mr. Edwards, Superintendent of Markets, show that 1,017 lots of bad meat were voluntarily handed over to the officers of the Markets and Fairs Committee, and 23 lots were seized by them. The total weight destroyed was 204 tons. Ten persons were summoned for exposing bad meat for sale and were fined £135 6s. 8d.

Five hundred and eighty-eight lots of bad fish, etc., were seized and 8 surrendered, the total amount destroyed being 145 tons. Two persons were summoned, the fines amounting to £7.

Eleven tons of bad fruit, etc., were destroyed.

WATER SUPPLY.

Corporation Water.

Throughout the year I analysed every month a sample of the Corporation Water. The results of these analyses are given in Table XIV.

I also analysed 170 samples of water taken from the various streams and deep wells from which the water supplied by the Corporation is derived.

Well Water.

Sixteen samples of well water were examined, chiefly from houses in which infectious disease had occurred. During the year 22 wells were closed. The results of the analyses are given in Table XIV.

SMOKE NUISANCES.

Smoke.

Throughout the year four assistant inspectors have as usual been engaged in watching factory chimneys, with the object of preventing any excessive pollution of the air by the discharge of dense black smoke. They made 6,431 observa-

tions, and reported that the regulations were broken in 152 instances, in all of which dense black smoke was emitted for more than ten minutes in an hour. In 99 cases the offenders were cautioned, and in the other 53 they were prosecuted and fined.

OFFENSIVE TRADES.

Offensive Trades.

No applications to establish offensive trades were brought under my notice and no grave complaints were made as to the carrying on of those already in existence.

BURIAL GROUNDS.

Proposed New Burial Ground.

In April last I received from the Town Clerk a copy of a communication in reference to an offer of a site for a church and burial ground. I recommended that your Committee oppose the suggestion of establishing a burial ground, inasmuch as the site was within the City Boundary and in a district which was likely to become thickly populated in the future, though it was not so then. The proposal was objectionable on account of the inevitable contamination of the ground water and of the air which must have resulted from the use of the site as a graveyard.

Removal of bodies.

During the year it became necessary to remove the bodies deposited in the Catacombs at Christ Church. The removals included those of 57 bodies which were claimed by relatives, and those of 78 unclaimed bodies. The claimed bodies were removed to various localities, including Selly Oak, Kidderminster, Perry Barr, Rowley Regis, and other places. The unclaimed bodies were taken to the cemetery in Warstone Lane.

Most of the coffins were of lead, but a considerable number were of oak or elm, and were much decayed. New shells were used where necessary, and chloride of lime was placed in each of the coffins. The work of removal was effected without any nuisance or injury to health.

ANALYTICAL WORK.

Miscellaneous Analyses.

Including those already alluded to under the heading Water Supply, I received during the year 372 samples of water, sewage and other articles not obtained under the

Miscellaneous Analyses—*continued.*

Food and Drugs or Margarine Acts. The following table gives particulars of the various Committees for whom the articles were analysed :—

		Number of Samples.
Water Committee—		
Water, Sewage, Sand		183
Health Committee—		
Water	28	
Cloth, Ale, Poudrette, etc. ...	38	
	—	66
Birmingham Tame and Rea Drainage Board :—		
Sewage, Effluent, Fungus ...		53
Public Works Committee—		
Sewage, Water	30	
Paint, Smocks, etc.	20	
	—	50
Other Committees and Officials—		
Water, Paint, etc.		20
Total Samples... ...		372

I remain,

Mr. Chairman and Gentlemen,

Your obedient Servant,

ALFRED HILL, M.D.,

Medical Officer of Health.

APPENDIX.

TABLE I.

Marriages, Births, and Deaths in the Thirteen Years 1886–1898.

Year.	Marriages.	Births.			Deaths.					
		Males.	Females.	Total.	Males.	Females.	Total.	Of Infants under One Year old.	From Seven chief Zymotic Diseases.	In Public Institutions.
1886	—	—	—	15,622	—	—	9,182	2,712	1,462†	1,239
1887	—	—	—	15,315	—	—	9,225	2,670	1,424†	1,259
1888	—	—	—	15,076	—	—	8,465	2,293	924†	1,195
1889	—	—	—	15,357	—	—	9,035	2,579	1,270†	1,320
1890	—	—	—	15,487*	—	—	10,329*	2,798*	1,391*†	1,600*
1891	—	8,100	8,066	16,166	5,175	4,902	10,077	2,673	976†	1,650
1892	4,322	8,074	7,952	16,026	4,934	4,708	9,642	2,664	1,279	1,411
1893	4,103	7,949	7,932	15,881	5,315	5,130	10,445	3,146	1,520	1,631
1894	4,241	7,831	7,674	15,505	4,659	4,287	8,946	2,539	1,237	1,549
1895	4,442	8,032	7,981	16,014	5,154	4,708	9,863	2,910	1,350	1,656
1896	5,024	8,392*	8,190*	16,582*	5,354*	5,051*	10,405*	3,265*	1,846*	1,554*
1897	5,515	8,602	8,169	16,771	5,572	5,096	10,668	3,594	1,909	1,489
1898 ...	5,321	8,779	8,510	17,289	5,152	4,782	9,936‡	3,287	1,400	1,518

* 53 weeks. † Membranous Croup not included. ‡ 2 sex unknown.

1.—Population at Census 1891, 478,116.
2.—Number of Inhabited Houses at Census 1891, 95,516.
3.—Average number of Persons in each House at Census 1891, 5·0.
4.—Area of the City, in acres, 12,795.

Population, Marriage-rates, Birth-rates, and Death-rates in the Thirteen Years 1886–1898.

Year.	Estimated Population.	Persons to an Acre.	Marriage-rate per 1,000 persons living.	Birth-rate per 1,000 persons living.	Death-rate per 1,000 persons living.	Death-rate in Infants under One Year per 1,000 Births.	Death-rate from Seven chief Zymotic Diseases.	Deaths in Public Institutions; Percentage on total deaths.
1886	458,110	36·1	—	34·2	20·1	174	3·2*	13·5
1887	462,251	36·4	—	33·2	20·0	174	3·1*	13·6
1888	466,430	36·7	—	32·4	18·2	152	2·0*	14·1
1889	470,646	37·0	—	32·7	19·2	168	2·7*	14·6
1890	474,900	37·4	—	32·1	21·4	181	2·9*	15·5
1891	479,193	37·7	—	33·8	21·1	165	2·0*	16·4
1892	483,526	38·1	17·9	33·2	20·0	166	2·7	14·6
1893	487,897	38·4	16·9	32·6	21·5	198	3·1	15·6
1894	492,301	38·7	17·3	31·6	18·2	164	2·5	17·3
1895	496,751	39·1	17·9	32·3	19·9	182	2·7	16·8
1896	501,241	39·5	20·0	32·5	20·4	197	3·6	14·9
1897	505,772	39·8	21·9	33·2	21·1	214	3·8	14·0
1898	510,343	40·2	20·9	34·0	19·5	190	2·8	15·3
Average of 5 years prior to 1898.	496,792	39·1	18·8	32·4	20·2	191	3·1	15·7

* Membranous Croup not included.

TABLE III.

Table of Deaths Registered in the City of Birmingham during the Year ending December 31st, 1898.

1898.	AGES.								WARDS.																Institutions.	City.
	0—1	1—5	5—10	10—15	15—25	25—45	45—65	65 and up.	Rotton Park.	All Saints'.	Ladywood.	St. Paul's.	St. George's.	St. Stephen's	St. Mary's.	St. Bartholomew's.	Market Hall.	St. Thomas's	St. Martin's.	Edgbaston & Harborne.	Deritend.	Bordesley.	Duddeston.	Nechells.	Bal'sHeath	Saltley.		
ALL CAUSES	2287	1209	214	119	395	1362	1868	1392	634	598	430	257	406	462	297	554	176	307	431	418	535	705	486	611	605	506	1518	9936
Small-pox	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Measles	42	134	4	..	1	1	..	..	13	22	..	1	3	1	5	11	5	1	18	4	17	13	10	25	22	9	2	182
Scarlet Fever	1	26	11	5	1	3	..	..	2	..	..	..	..	1	..	..	..	2	..	..	1	..	2	.	1	2	36	47
Diphtheria	2	66	35	3	5	3	..	..	10	3	5	4	3	1	..	1	..	2	4	5	2	9	1	1	32	3	28	114
Membranous Croup	3	11	4	..	..	..	..	..	1	1	1	2	..	..	1	..	.	1	2	..	1	1	..	..	4	3	..	18
Whooping Cough	104	148	4	..	..	..	..	..	27	13	16	9	13	17	7	13	10	8	7	11	22	20	11	14	23	12	3	256
Typhus Fever	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Enteric or Typhoid Fever	..	6	8	16	36	38	8	1	10	9	9	1	5	6	1	10	1	2	3	1	5	5	3	3	4	4	31	113
Simple Continued, or Ill-defined Fever	..	1	1	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	2
Relapsing Fever	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Influenza	8	5	1	1	7	24	33	10	12	4	1	2	..	1	..	8	6	2	2	7	8	14	1	4	7	7	3	89
Other Miasmatic Diseases	1	1	2	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	1	.	.	4
Asiatic Cholera	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.	..
Diarrhœa, Dysentery	534	83	2	1	1	5	12	30	37	50	24	26	33	35	18	45	7	41	26	17	44	50	45	45	52	41	32	668
Malarial Diseases	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1
Zoogenous Diseases	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1
Venereal Diseases	23	2	..	..	1	7	5	..	2	2	2	..	1	1	..	1	1	2	.	1	1	1	1	1	..	..	21	38
Erysipelas	5	..	..	..	1	5	3	1	..	.	..	1	1	..	..	1	..	..	2	1	2	..	1	..	2	..	4	15
Puerperal Fever	..	..	..	..	9	5	..	..	..	2	1	..	1	1	1	2	..	1	2	..	..	..	1	..	1	1	.	14
Other Septic Diseases	2	4	..	1	..	2	1	1	1	..	..	..	..	..	1	..	1	..	..	..	.	1	1	..	..	..	6	11
Parasitic Diseases	2	..	..	1	..	1	..	..	..	..	..	..	2	..	..	..	1	..	..	..	..	..	..	..	.	1	..	4
Intemperance	..	..	..	..	..	26	19	4	3	3	2	2	2	1	1	5	2	2	4	4	5	5	..	..	2	1	5	49
Other Dietic Diseases	11	..	..	..	..	..	1	..	2	..	2	..	..	..	..	1	..	1	..	..	..	2	..	..	3	..	1	12
Rheumatic Fever	1	1	2	3	3	14	6	..	1	..	..	..	2	1	..	1	..	..	2	3	1	5	5	1	3	2	4	30
Rheumatism	..	..	2	..	1	4	5	7	1	4	1	1	..	1	..	2	..	1	..	..	2	1	2	..	1	..	2	19
Rickets	11	19	..	..	..	..	..	..	4	4	4	1	1	2	1	..	1	2	2	..	1	3	1	..	1	..	2	30
Cancer, Malignant Disease	..	2	2	1	7	56	188	86	31	19	16	9	11	11	7	9	5	7	15	23	16	19	13	9	17	16	89	342
Tabes Mesenterica	40	19	..	3	1	..	1	..	15	2	5	2	.	3	1	3	3	6	..	1	4	5	2	4	2	3	3	64
Tubercular Meningitis	32	52	10	2	3	3	..	..	12	3	7	1	5	5	1	6	2	4	6	5	1	11	4	8	5	2	13	102
Phthisis pulmonalis	2	4	7	10	109	372	199	15	35	38	39	12	19	32	27	35	13	25	38	23	43	56	25	45	36	30	147	718
Tuberculosis, Scrofula	20	15	6	5	7	10	5	2	6	7	3	1	3	1	1	5	3	2	2	3	3	3	6	5	3	1	12	70
Other Constitutional Diseases	2	6	3	1	8	18	28	3	2	2	3	4	3	1	2	1	2	1	5	7	4	4	5	6	3	2	12	69

TABLE OF DEATHS REGISTERED IN THE CITY OF BIRMINGHAM DURING THE YEAR ENDING DECEMBER 31ST, 1898—(*continued.*)

1898.	AGES.								WARDS.															
	0—1	1—5	5—10	10—15	15—25	25—45	45—65	65 and up.	Rotton Park.	All Saints'.	Ladywood.	St. Paul's.	St. George's.	St. Stephen's.	St. Mary's.	St. Bartholomew's.	Market Hall.	St. Thomas's.	St. Martin's.	Edgbaston & Harborne.	Deritend.	Bordesley.	Duddeston.	Nechells	Balsall Heath	Saltley.	Institutions.	City.
Premature Birth	371	1	..	..	..	..	..	..	27	38	21	7	16	15	15	31	5	13	15	17	21	33	23	34	14	20	7	372
Atelectasis	32	..	..	..	..	..	..	..	..	3	2	..	2	1	3	..	2	..	1	..	2	11	..	4	1	..	..	32
Congenital Malformations	27	3	..	..	1	..	..	..	2	3	1	1	1	2	2	3	..	1	1	..	..	4	1	1	..	2	6	31
Old Age	..	..	..	.	..	..	20	455	28	32	23	13	21	16	9	13	6	9	25	36	14	27	17	12	21	21	132	475
Convulsions	178	27	2	1	..	..	..	..	12	15	7	6	8	11	9	24	3	5	8	7	16	26	13	8	12	11	4	208
Other Diseases of Nervous System	90	79	21	13	20	121	249	162	43	33	37	13	26	24	20	34	5	24	30	45	30	49	31	52	41	41	177	755
Diseases of Eye, Ear, and Nose	3	3	3	2	2	..	..	..	1	1	..	..	..	.	..	..	1	..	.	1	..	..	..	2	..	1	6	13
Heart Disease	19	3	12	21	49	151	264	155	41	42	31	27	34	20	12	33	16	27	27	32	28	53	37	34	34	35	102	674
Other Diseases of Circulatory System	..	.	..	..	1	12	30	16	5	2	1	1	..	3	..	3	1	2	..	3	2	1	1	4	4	3	23	59
Croup	..	6	1	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	1	1	1	..	1	1	..	..	7
Bronchitis, Pneumonia, Pleurisy	393	329	20	3	43	162	412	264	73	82	67	53	88	100	49	97	22	55	83	66	97	115	99	112	93	88	187	1626
Other Diseases of Respiratory System	32	22	..	..	2	17	27	15	10	4	9	2	3	..	2	7	1	6	6	7	6	5	11	8	8	8	12	115
Dentition	51	28	..	..	..	..	..	..	10	6	4	4	4	2	2	5	..	3	3	1	3	6	3	11	5	6	1	79
Enteritis	424	69	7	4	3	15	16	6	32	32	14	11	30	50	50	54	10	5	25	13	34	42	26	34	33	36	13	544
Cirrhosis of Liver	..	..	1	..	2	21	60	7	6	6	4	5	5	4	3	3	2	4	4	5	4	7	4	10	3	3	9	91
Other Diseases of Liver	9	..	..	..	..	6	14	13	4	2	3	1	1	3	1	1	2	2	4	4	2	2	1	2	5	..	2	42
Other Diseases of Digestive System	65	18	11	4	18	47	61	41	11	16	9	3	10	13	3	8	5	2	12	15	15	25	10	15	23	11	59	265
Diseases of Lymphatic System and of Ductless Glands	3	3	1	..	5	3	10	2	1	4	3	..	..	..	..	2	..	..	..	1	1	3	1	1	2	..	8	27
Diseases of Urinary System	3	6	7	6	5	68	91	44	17	8	9	6	8	8	7	2	4	9	8	15	6	8	7	6	12	8	82	230
Diseases of Organs of Generation	..	..	..	..	4	10	8	4	3	1	..	..	..	..	..	4	1	1	1	1	..	3	..	1	1	..	9	26
Diseases of Parturition	..	..	..	..	11	48	1	..	9	6	4	3	3	2	4	1	1	..	1	1	3	6	2	9	3	1	1	60
Diseases of Organs of Locomotion	6	3	1	1	2	4	3	..	..	..	..	..	..	..	1	2	2	.	..	..	..	2	..	3	1	..	9	20
Diseases of Integumentary System	8	..	..	..	1	1	6	5	..	1	..	..	2	1	..	2	..	..	1	..	4	1	..	..	1	..	8	21
Accidental Suffocation	94	7	..	..	3	..	3	1	7	5	10	4	2	8	3	9	6	4	3	4	8	7	7	9	8	3	1	108
Other Accidents	13	41	21	11	11	51	40	31	14	11	2	1	2	2	4	7	7	1	5	3	8	4	2	1	7	8	130	219
Homicide	1	2	..	..	1	2	4	..	..	..	..	..	1	..	..	3	..	1	..	..	..	..	1	..	..	..	4	10
Suicide	..	..	..	..	8	16	18	5	3	2	1	1	2	1	..	2	1	1	3	5	1	5	2	1	1	2	11	47
Execution	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.	..	..	..	..
Debility, Atrophy, Inanition, Marasmus	589	41	2	..	..	1	6	..	30	44	24	15	28	40	20	42	8	18	21	19	43	29	44	65	40	56	53	639
Other Ill-defined and not specified causes	30	3	..	..	2	7	11	6	12	11	2	1	1	2	1	2	2	1	4	..	3	2	2	..	6	2	5	59

TABLE IV.

DEATHS FROM THE PRINCIPAL ZYMOTIC DISEASES IN THE THIRTEEN YEARS, 1886 TO 1898.

	1886.	1887.	1888.	1889.	1890.*	1891.	1892.	1893.	1894.	1895.	1896.*	1897.	1898.	Annual Average of 5 years prior to 1898.
Smallpox	0	2	0	0	0	7	0	70	171	8	4	0	0	51
Measles	402	251	202	214	354	107	340	48	316	133	310	414	182	244
Scarlet Fever ...	42	37	40	162	218	95	68	68	75	133	154	95	47	105
Diphtheria	80	67	48	59	66	43	67	43	50	163	246	130	114	126
Membranous Croup	?	?	?	?	?	?	35	40	41	51	47	30	18	42
Whooping Cough ...	99	403	248	297	224	303	285	321	219	173	386	227	256	265
Fever — Typhus	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Fever — Enteric or Typhoid	63	77	64	45	64	80	39	94	105	82	108	89	113	96
Fever — Continued ..	6	8	5	4	2	1	2	8	4	2	2	0	2	3
Diarrhœa	770	579	317	489	463	340	443	828	256	605	589	923	668	640

* 53 weeks.

TABLE V.

Deaths from certain Causes in the Years 1891–1898.

DEATHS FROM	1891	1892	1893	1894	1895	*1896	1897	1898
Cancer	324	293	313	303	332	346	376	342
Phthisis	815	716	775	630	718	694	679	718
Other Tubercular Diseases	266	265	270	229	287	258	258	236
Premature Birth	295	345	359	346	376	384	425	372
Old Age	477	348	541	388	510	430	482	475
Bronchitis, Pneumonia, and Pleurisy	2,469	2,100	2,188	1,811	1,770	1,838	1,870	1,626
Diseases of Nervous System	902	864	915	861	931	989	939	963
Diseases of Heart	673	684	584	586	613	628	641	674
Diseases of Digestive System	570	597	712	582	772	828	1,027	1,021
Diseases of Urinary System	222	225	256	215	207	230	234	230
Accident or Negligence	356	292	296	280	329	279	326	327
Debility, Atrophy, Inanition, and Marasmus ...	593	592	750	615	658	677	623	639

* 53 weeks.

TABLE VI.

BIRTH-RATES AND DEATH-RATES IN 33 GREAT TOWNS DURING 1898. *(Extracted from the Registrar General's Annual Summary.)*

CITIES AND BOROUGHS.	BIRTH-RATE.	DEATH RATES PER 1000 PERSONS LIVING FROM									DEATHS under 1 Year to 1000 Births.	PERCENTAGE to Total Deaths.		CITIES AND BOROUGHS.
		All causes.	Principal Zymotic Diseases.	Small-pox.	Measles.	Scarlet Fever.	Diph-theria.	Whooping Cough.	Fever.	Diarrhœa.		Inquest Cases.	Uncertified Causes of Death.	
33 TOWNS	30·3	19·0	2·85	0·00	0·56	0·14	0·31	0·42	0·20	1·22	178	7·5	1·2	33 TOWNS.
LONDON	29·5	18·7	2·78	0·00	0·68	0·13	0·39	0·48	0·13	0·97	167	9·0	0·6	LONDON.
WEST HAM	30·6	15·4	2·68	—	0·32	0·08	0·63	0·42	0·25	0·98	170	7·2	2·4	WEST HAM.
CROYDON	25·4	13·9	1·99	—	0·27	0·07	0·14	0·28	0·09	1·14	150	8·1	—	CROYDON.
BRIGHTON	24·8	16·9	2·36	—	0·67	0·06	0·17	0·17	0·15	1·14	181	7·1	0·5	BRIGHTON.
PORTSMOUTH	26·7	16·3	2·16	—	0·37	0·17	0·30	0·23	0·23	0·86	156	6·3	1·0	PORTSMOUTH.
PLYMOUTH	29·7	19·5	2·15	—	0·71	0·04	0·11	0·28	0·06	0·95	170	6·0	0·6	PLYMOUTH.
BRISTOL	28·6	17·2	2·69	—	0·97	0·04	0·14	0·36	0·08	1·10	164	7·9	0·7	BRISTOL.
CARDIFF	31·1	14·8	2·24	—	0·28	0·05	0·73	0·24	0·10	0·84	158	6·7	0·7	CARDIFF.
SWANSEA	28·9	18·6	3·21	—	0·87	0·11	1·22	0·39	0·13	0·49	184	6·4	1·5	SWANSEA.
WOLVERHAMPTON	35·8	21·3	3·19	—	0·22	0·26	0·43	0·10	0·23	1·95	200	6·5	1·1	WOLVERHAMPTON.
BIRMINGHAM*	34·0	20·0	2·78	—	0·36	0·09	0·26	0·49	0·22	1·36	191	5·0	2·9	BIRMINGHAM.*
NORWICH	29·9	19·0	3·26	—	0·67	0·21	0·13	0·33	0·40	1·52	192	5·8	0·8	NORWICH.
LEICESTER	29·6	16·9	3·35	—	1·03	0·21	0·30	0·09	0·14	1·58	191	6·4	2·4	LEICESTER.
NOTTINGHAM	28·9	17·7	2·37	—	0·44	0·14	0·10	0·25	0·24	1·20	178	5·9	0·8	NOTTINGHAM.
DERBY	27·4	16·8	2·26	—	0·51	0·19	0·09	0·27	0·27	0·93	169	9·0	—	DERBY.
BIRKENHEAD	30·4	17·4	2·53	—	0·27	0·28	0·43	0·07	0·34	1·11	186	6·9	0·8	BIRKENHEAD
LIVERPOOL	35·2	24·0	3·22	0·00	0·44	0·23	0·23	0·52	0·26	1·54	184	6·3	3·4	LIVERPOOL.
BOLTON	30·9	19·4	2·93	—	0·25	0·19	0·07	0·37	0·31	1·74	168	8·7	0·3	BOLTON.
MANCHESTER	32·7	21·9	3·11	—	0·50	0·12	0·10	0·32	0·23	1·84	197	7·3	0·8	MANCHESTER.
SALFORD	34·7	22·7	4·03	—	0·46	0·29	0·15	0·60	0·37	2·16	212	6·2	1·0	SALFORD.
OLDHAM	25·3	17·6	2·15	—	0·57	0·16	0·07	0·44	0·15	0·76	175	5·2	0·1	OLDHAM.
BURNLEY	27·1	16·3	2·04	—	0·07	0·05	0·27	0·06	0·25	1·34	195	6·2	1·7	BURNLEY.
BLACKBURN	27·1	18·4	2·57	—	0·38	0·12	0·23	0·04	0·24	1·56	206	5·7	3·3	BLACKBURN.
PRESTON	31·0	19·3	3·07	—	0·02	0·03	0·07	0·53	0·37	2·05	225	3·3	2·9	PRESTON.
HUDDERSFIELD	22·5	15·9	1·61	—	0·31	0·10	0·13	0·11	0·10	0·86	153	5·2	2·2	HUDDERSFIELD.
HALIFAX	22·9	17·9	2·15	—	0·73	0·15	0·08	0·36	0·19	0·64	163	5·0	2·7	HALIFAX.
BRADFORD	24·0	17·6	2·12	—	0·45	0·05	0·07	0·29	0·21	1·05	185	6·4	1·2	BRADFORD.
LEEDS	31·2	19·2	3·12	0·00	0·46	0·29	0·54	0·39	0·22	1·22	182	8·1	0·4	LEEDS.
SHEFFIELD	33·9	20·2	3·82	—	0·49	0·16	0·26	0·62	0·40	1·89	195	4·1	2·3	SHEFFIELD.
HULL	33·1	18·4	2·99	—	0·40	0·12	0·07	0·30	0·25	1·85	182	7·7	1·4	HULL.
SUNDERLAND	35·4	22·6	3·69	0·01	0·59	0·22	0·06	0·47	0·48	1·86	202	7·0	0·7	SUNDERLAND.
GATESHEAD	35·5	20·6	3·10	0·03	0·49	0·18	0·10	0·61	0·17	1·49	208	6·4	0·3	GATESHEAD.
NEWCASTLE	31·7	21·4	2·84	0·01	0·57	0·11	0·13	0·62	0·30	1·10	190	8·2	0·7	NEWCASTLE.

* Including paupers belonging to Birmingham, who died in Workhouses and Asylums outside the City.

TABLE VII.

Number of Cases Reported under the Infectious Disease (Notification) Act, 1889, during each Week of the Year 1898.

Week. Number.	Date of ending.	Smallpox.	Scarlet Fever.	Diphtheria.	Membranous Croup.	Typhus Fever	Typhoid Fever.	Simple Continued Fever.	Relapsing Fever.	Puerperal Fever.	Cholera.	Erysipelas.	Total.
	1898.												
1	January 8th	...	41	24	...	...	16	1	...	2	...	9	93
2	„ 15th	...	24	13	...	...	17	1	...	1	...	12	68
3	„ 22nd	...	30	10	...	...	5	...	...	...	...	11	56
4	„ 29th	...	32	22	...	...	18	...	..	...	...	14	86
5	February 5th	...	24	14	1	...	16	1	...	...	...	14	70
6	„ 12th	...	29	22	2	...	16	1	...	...	...	5	75
7	„ 19th	...	23	14	1	...	20	...	..	...	...	10	68
8	„ 26th	...	23	13	...	...	17	1	...	1	...	17	72
9	March 5th	...	31	16	...	...	11	..	...	...	...	13	71
10	„ 12th	...	22	11	2	...	15	2	...	...	...	16	68
11	„ 19th	...	27	22	1	...	22	...	...	1	...	10	83
12	„ 26th	...	16	10	3	...	16	...	...	...	...	17	62
13	April 2nd	...	17	9	2	...	22	...	...	...	...	16	66
14	„ 9th	...	25	12	1	...	19	...	...	...	...	7	64
15	„ 16th	...	26	11	1	...	16	...	...	...	...	4	58
16	„ 23rd	...	21	13	...	...	8	...	...	1	...	5	48
17	„ 30th	...	20	9	...	...	14	...	...	...	...	12	55
18	May 7th	...	14	6	1	...	8	...	...	...	...	7	36
19	„ 14th	...	20	12	1	...	9	...	...	...	...	7	49
20	„ 21st	...	17	7	...	...	9	...	...	1	...	6	40
21	„ 28th	...	19	5	...	...	9	...	...	...	...	15	48
22	June 4th	...	23	2	...	...	5	...	...	...	...	13	43
23	„ 11th	...	8	13	...	...	4	...	...	...	...	10	35
24	„ 18th	...	21	7	1	...	6	...	...	...	...	10	45
25	„ 25th	...	18	8	...	...	5	...	...	2	...	9	42
26	July 2nd	..	28	12	...	...	3	...	...	...	...	13	56
27	„ 9th	...	19	3	1	...	6	...	...	...	...	8	37
28	„ 16th	...	24	12	...	...	2	...	...	...	...	11	49
29	„ 23rd	...	31	18	...	...	6	2	...	...	...	15	72
30	„ 30th	...	21	15	2	...	8	..	...	...	..	11	57
31	August 6th	...	20	23	2	...	13	...	...	...	...	7	65
32	„ 13th	...	29	12	...	...	11	...	...	1	...	12	65
33	„ 20th	...	34	12	...	...	8	...	...	1	...	20	75
34	„ 27th	...	28	10	...	...	13	...	...	...	...	13	64
35	September 3rd	...	29	11	1	...	14	...	...	...	...	13	68
36	„ 10th	...	34	15	...	...	15	...	...	1	...	13	78
37	„ 17th	...	32	11	...	...	21	...	...	1	...	7	72
38	„ 24th	...	30	12	...	...	15	...	...	2	...	14	73
39	October 1st	...	28	11	2	...	20	1	...	2	...	15	79
40	„ 8th	...	30	8	1	...	15	...	...	1	...	15	70
41	„ 15th	...	37	10	1	...	11	...	...	...	...	15	74
42	, 22nd	...	23	12	1	...	20	...	...	...	...	6	62
43	„ 29th	...	36	21	1	...	11	...	...	...	...	11	80
44	November 5th	...	31	10	...	...	9	...	...	2	...	13	65
45	„ 12th	...	26	7	1	...	19	...	...	...	...	19	72
46	„ 19th	...	25	13	...	...	18	1	...	...	...	18	75
47	„ 26th	...	22	7	1	...	12	...	...	...	...	20	62
48	December 3rd	...	34	13	2	...	7	...	...	1	..	17	74
49	„ 10th	...	22	16	1	...	9	...	...	1	...	18	67
50	„ 17th	...	35	21	1	...	5	...	...	...	...	10	72
51	„ 24th	...	24	19	3	...	10	...	...	1	...	17	74
52	„ 31st	...	17	11	1	...	13	1	...	1	...	17	61
	Totals ...	...	1320	650	39	...	637	12	...	24	...	637	3319

Cases removed to City Hospital:—Smallpox, 0; Scarlet Fever, 1,083.

TABLE VIII.

Cases of Infectious Disease Notified during the Year ending December 31st, 1898.

Classified according to ages, wards, and institutions.

DISEASES.	AGES.								WARDS.																Institutions.	CITY.
	0 to 1.	1 to 5.	5 to 10.	10 to 15.	15 to 25.	25 to 45.	45 to 65.	65 and up.	Rotton Park.	All Saints'.	Ladywood.	St. Paul's.	St. George's.	St. Stephen's.	St. Mary's.	St. Bartholomew's.	Market Hall.	St. Thomas's.	St. Martin's.	Edgbaston and Harborne.	Deritend.	Bordesley.	Duddeston.	Nechells.	Balsall Heath.	Saltley.		
SMALLPOX	..	..	..	..	.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
SCARLET FEVER ..	15	389	478	238	155	41	4	..	197	74	119	27	47	43	19	46	29	45	55	84	61	169	51	51	122	60	21	1320
DIPHTHERIA	8	188	151	71	118	100	13	1	96	29	67	32	36	24	10	19	8	16	25	43	17	52	7	15	134	14	6	650
MEMBRANOUS CROUP.	4	29	6	..	..	..	..	..	1	4	3	2	1	4	4	3	..	1	1	..	1	2	1	1	4	6	..	39
TYPHUS FEVER.. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.	..	.	..	..	..	..	..
TYPHOID FEVER ..	2	43	109	111	174	169	26	3	61	56	44	31	42	66	12	63	16	21	27	17	27	29	12	38	35	34	6	637
SIMPLE CONTINUED FEVER	..	..	1	2	7	2	..	..	1	3	1	..	2	2	..	2	..	..	1	..	..	..	..	..	..	..	..	12
RELAPSING FEVER ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
PUERPERAL FEVER ..	..	..	..	..	13	11	..	..	..	5	1	1	2	1	1	1	..	2	2	..	1	1	1	1	3	1	..	24
CHOLERA..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
ERYSIPELAS	21	44	38	44	89	214	147	40	73	33	47	25	28	35	33	41	8	34	27	38	19	45	25	20	41	51	14	637
Totals .	50	693	783	466	556	537	190	44	429	204	282	118	158	175	79	175	61	119	138	182	126	298	97	126	339	166	47	3319

TABLE IX.

CASES OF INFECTIOUS DISEASE NOTIFIED DURING EACH OF THE SEVEN YEARS, 1892–1898.

	1892.	1893.	1894.	1895.	1896.	1897.	1898.	Average of five years, prior to 1898.
SMALLPOX	27	979	2,074	100	14	0	0	633
SCARLET FEVER	1,418	1,614	1,788	2,964	3,389	1929	1,320	2,337
DIPHTHERIA	456	322	316	640	1,100	655	650	606
MEMBRANOUS CROUP ...	77	65	90	101	94	58	39	82
TYPHUS FEVER	0	4	0	0	0	1	0	1
TYPHOID FEVER	260	489	511	436	483	533	637	490
SIMPLE CONTINUED FEVER	5	25	7	4	6	1	12	9
RELAPSING FEVER	1	0	0	0	1	0	0	0
PUERPERAL FEVER	40	54	42	24	31	17	24	34
CHOLERA	0	0	0	0	0	0	0	0
ERYSIPELAS	569	852	772	818	782	585	637	762
TOTAL ...	2,853	4,404	5,600	5,087	5,900	3,779	3,319	4,954

TABLE X.

Temperature of the Air and Ground, Rainfall, Sunshine, and Wind, in each Month of the Year 1898.

Observed at the Birmingham and Midland Institute Observatory, Edgbaston, by Mr. Alfred Cresswell.

Month.	Temperature of the Air.						Temperature of the Ground.		Hours of Sunshine.		Rainfall in Inches.		Days on which Rain Fell.	Miles of Wind.	
	Highest in the shade.		Lowest in the shade.		Mean for the month.		Highest 1 foot deep.	Highest 4 feet deep.							
	1898.	Above or below the previous highest. *	1898.	Above or below the previous lowest. *	1898.	Above or below the average. *			1898.	Above or below the average. *	1898.	Above or below the average. *		1898.	Above or below the average. *
January ..	55·1	− 2·9	31·0	+ 20·2	42·2	+ 6·2	46·0	46·6	31	− 5	0·83	− 0·91	7	8580	− 1330
February ..	56 6	− 5·3	24·4	+ 16·4	38·9	+ 1·5	46·0	46·5	76	+ 23	1·47	+ 0·29	12	10922	+ 1732
March ..	56·0	− 8·8	27·1	+ 5·8	38·1	− 2·4	45·3	44·4	55	− 40	0·63	− 1·12	12	9701	− 715
April	64·9	− 14·1	30·7	+ 3·7	46·0	+ 1·1	47·4	45·9	133	+ 23	1·85	+ 0·20	12	8722	− 318
May	67·8	− 9·8	35·3	+ 4·3	49·0	− 2·4	50·2	47·9	101	− 46	2·62	+ 0·77	18	9924	+ 585
June	72·7	− 10·1	40·8	+ 2·5	55·7	− 2·2	57·8	51·2	130	− 19	1·06	− 0·99	15	8068	+ 175
July	76·8	− 7·8	44·0	+ 4·5	58·8	− 0·5	60·9	54·1	146	+ 16	1·29	− 0·99	7	7940	− 688
August ..	80·0	− 5·6	46·1	+ 4·9	57·9	− 0·8	61·2	55·4	115	− 14	2·57	− 0·36	13	9246	+ 528
September ..	82·8	+ 1·0	37·5	+ 4·5	58·2	+ 3·2	62·2	56·1	159	+ 51	0·64	− 1·38	2	7168	− 1062
October ..	66·8	− 3·2	39·0	+ 11·1	51·0	+ 4·4	54·2	54·6	35	− 37	2·74	+ 0·20	16	8479	− 526
November ..	58·8	− 2·8	26·7	+ 3·2	43·8	+ 1·1	51·6	52·8	38	+ 1	2·51	+ 0·21	12	8628	− 880
December ..	55·8	− 0·2	29·9	+ 15·4	44·4	+ 6·7	49·9	49·0	37	+ 4	2·24	+ 0·03	12	12075	+ 2022

* In the eleven years 1887–1897.

TABLE XI.

Temperature and Rainfall in each Month and Year from 1887 to 1898.

MONTH.	TEMPERATURE.													RAINFALL.											
	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	Average for 11 years 1887-1897.	1898	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	Average for 11 years 1887-1897.	1898
	°	°	°	°	°	°	°	°	°	°	°	°														
JANUARY ...	35·2	37·2	36·8	41·1	34·4	35·2	35·1	36·7	30·6	39·9	33·7	36·0	42·2	1·19	0·50	0·59	2·80	1·92	1·98	1·75	1·61	3·92	1·15	1·89	1·74	0·83
FEBRUARY	38·3	34·8	36·5	36·8	40·2	37·3	39·2	39·9	27·5	39·1	41·5	37·4	38·9	0·62	0·11	1·66	0·52	0·69	1·41	2·56	2·05	0·32	0·56	2·54	1·18	1·47
MARCH ...	37·6	36·9	39·5	42·6	38·8	35·6	45·3	42·6	40·4	43·5	42·8	40·5	38·1	1·38	2·41	2·64	1·47	1·22	0·85	0·50	1·05	1·91	2·68	3·14	1·75	0·63
APRIL ...	41·6	42·1	43·7	44·0	42·4	44·9	49·6	48·5	45·5	47·6	43·5	44·9	46·0	1·47	1·89	2·91	0·69	2·13	1·23	0·33	1·62	2·37	1·33	2·02	1·65	1·85
MAY ...	47·6	51·1	54·3	52·7	48·4	53·2	54·5	47·1	53·9	52·9	49·8	51·4	49·0	1·88	0·83	4·00	2·12	3·38	1·85	2·08	2·01	0·82	0·21	1·20	1·85	2·62
JUNE ...	59·9	55·2	59·0	57·1	57·4	56·5	59·0	55·6	58·0	60·7	58·4	57·9	55·7	2·17	2·16	0·49	1·62	3·27	2·74	1·08	2·16	0·89	1·91	4·13	2·05	1·06
JULY ...	63·9	55·9	59·0	57·6	58·0	56·8	61·0	59·8	58·5	61·1	61·0	59·3	58·8	0·93	5·11	1·53	2·39	2·08	2·52	1·64	3·36	3·25	1·25	0·95	2·28	1·29
AUGUST ...	60·2	57·4	58·6	57·5	56·9	59·2	63·2	56·4	59·2	56·8	60·1	58·7	57·9	2·38	3·27	2·92	3·74	3·56	3·73	2·25	2·12	2·75	1·74	3·81	2·93	2·57
SEPTEMBER	52·5	53·7	55·1	58·6	57·2	54·0	54·8	52·1	59·9	54·4	52·9	55·0	58·2	2·31	1·20	2·17	1·26	1·63	2·97	1·72	1·70	0·45	4·34	2·48	2·02	0·64
OCTOBER ...	44·4	46·6	46·8	49·2	48·4	44·5	48·8	47·2	44·8	43·3	49·1	46·6	51·0	2·11	0·32	3·19	1·56	5·36	2·84	2·45	3·48	2·81	2·50	1·31	2·54	2·74
NOVEMBER	40·1	45·5	44·0	42·5	41·3	43·2	39·9	45·1	44·6	38·9	44·6	42·7	43·8	1·78	4·41	1·04	3·22	2·74	1·79	1·38	2·48	3·41	1·26	1·96	2·30	2·51
DECEMBER	37·3	40·3	37·9	29·8	39·2	34·7	39·5	40·1	38·0	38·1	39·8	37·7	44·4	1·58	2·41	1·80	0·71	3·16	1·69	3·02	1·88	1·99	3·34	2·78	2·21	2·24
YEAR ...	46·5	46·4	47·6	47·5	46·9	46·3	49·2	47·6	46·7	48·0	48·1	47·3	48·7	19·80	24·62	24·94	22·10	31·14	25·60	20·76	25·52	24·89	22·27	28·21	24·50	20·45

TABLE XII.

SUMMARY OF NUISANCES ABATED AND OTHER WORK DONE DURING THE YEAR 1898.

(RETURNS MADE BY MR. PARKER, *Inspector of Nuisances.*)

DWELLING HOUSES.

No. of Houses cleansed	1,158
,, Houses repaired	1,353
,, Houses closed	81
,, Houses made fit for habitation	38
,, Houses provided with better ventilation	39
,, Houses provided with water	2
,, Cases of overcrowding remedied	80
,, Accumulations of water in cellars removed	241
,, Rain-water Spouts repaired	217

CLOSETS.

No. of Ashpit Privies converted to water closets	1,458
,, Pan Privies converted to water closets	210
,, Privies cleansed	1,504
,, Water Closets repaired	555
,, Pan Privies repaired	379
,, Tub Sheds repaired	202
,, Additional Water Closets provided	213
,, Soilpipes removed from inside houses	15
,, Urinals cleansed, repaired, or reconstructed	385

DRAINAGE.

No. of Drains opened and cleansed	3,405
,, Drains efficiently trapped	1,312
,, Drains in cellars disconnected from the sewer or abolished	54
,, Drains removed from under Dwelling Houses	4
,, Sink Drains disconnected from the sewer	93
,, Sink Bend Pipes repaired or affixed	316
,, Overflow-pipes of Water Cisterns disconnected from the sewer	8
,, Premises supplied with additional drains	145

OTHER NUISANCES ABATED AND WORK DONE.

No. of Back Yards paved	403
,, Back Yards repaired	387
,, Courts cleansed by the Staff	1,442
,, Premises from which fowls have been removed	465
,, Nuisances from swine and swine styes abated	34
,, Accumulations of wash, manure, etc., removed	1,052
,, Dangerous Premises reported to the City Surveyor's Department, and rendered safe	704
,, Defective Water Fittings reported to the Water Department, and repaired	480

DISINFECTION.

No. of Houses disinfected	1,114
,, Beds and Mattresses disinfected	2,206
,, Sheets, Blankets, and Counterpanes disinfected	3,448
,, Pillows and Bolsters disinfected	3,216
,, Garments disinfected	4,708
,, Carpets disinfected	207
,, other Articles disinfected	720

SMOKE NUISANCES.

No. of Observations made by the Inspectors	6,431
,, Manufacturers Reported for breaking the regulations ..	152
,, ,, Cautioned	99
,, ,, Summoned	53

LODGING HOUSES.

No. of Registered Common Lodging Houses	77
,, Lodgers allowed	2,218
,, Houses Registered as let in lodgings	77
,, Lodgers allowed	438
,, Visits by day	12,275
,, Visits by night	962
,, Persons found occupying the Houses	21,282
,, Common Lodging Houses closed	2
,, Houses let in lodgings closed	3
,, Keepers summoned	3

CANAL BOATS.

No. of Boats registered	26
,, Boats inspected	804
,, Boats properly marked or numbered	14
,, Certificates of registration provided	25
,, Boats put into habitable condition	5
,, Cases of mixing the sexes remedied	7
,, Cases of overcrowding remedied	12
,, Dirty Cabins cleansed	2
,, Vessels for drinking water provided	11
,, Unregistered boats discovered	3
,, Boats painted by order	0

WORKSHOPS.

No. of Visits to Workshops	7,061
,, Workshops limewashed	688
,, Workshops fumigated	0
,, Workshops more efficiently ventilated	35
,, Workshops closed	2
,, Workshops reported as dangerous and made safe	17
,, Workshops repaired	32
,, Additional water closets provided	132
,, Water closets repaired	50
,, Ashpits removed, water closets being provided	48
,, Pan Privies converted into water closets	27
,, Urinals provided	26
,, Drains repaired or trapped	84
,, Drains removed	14
,, Cases of overcrowding remedied	8
,, Workshops discontinued as dwellings	3
,, Yards paved	6
,, Accumulations of refuse removed	6
,, Animals removed	6

DAIRIES, COW SHEDS, AND MILKSHOPS.

No. of Visits to Dairies	159
,, Visits to Cow Sheds	2,024
,, Visits to Milk Shops and Milk Stores	4,389
,, Shops, Cellars, and Pantries limewashed	121
,, Lamp Oil, Tripe, Fish, and Vinegar Businesses prohibited	77
,, Dirty Vessels found at Milk Shops and Stores	12
,, Dirty Vessels found at Railway Stations	31

BAKEHOUSES.

No. of Visits to Bakehouses	1,067
,, Bakehouses limewashed	60
,, Bakehouses repaired	4
,, Drains removed from Bakehouses	2
,, Animals removed	3

UNWHOLESOME FOOD.

(Return made by Mr. Edwards, *Superintendent of the Markets.)*

Voluntary Surrenders of Bad Meat	1,017
Seizures of Bad Meat	23
Weight Destroyed	204 tons
Voluntary Surrenders of Bad Fish, &c.	588
Seizures of Bad Fish, etc.	8
Weight destroyed	145 tons
Weight of Bad Fruit, etc., destroyed	11 tons

CONTAGIOUS DISEASES (ANIMALS) ACT.

(Return made by Mr. Edwards, *Superintendent of the Markets.)*

No. of Visits to Slaughter Houses	15,367
,, ,, Railway Stations	1,314
,, ,, Cow Houses	54

TABLE XIII.

RETURN FOR THE PERIOD 1ST JULY, 1897, TO 30TH JUNE, 1898, RESPECTING THE VACCINATION OF CHILDREN WHOSE BIRTHS WERE REGISTERED IN THE CITY DURING THE SAID PERIOD.

	Number of Births returned in the "Birth List Sheets" as Registered.	Number of these Births duly entered in Columns 10, 11, and 13 of the "Vaccination Register" (Birth List Sheets), viz.:				Exempt through Conscientious Objection.	Number of these Births which remained unentered in the "Vaccination Register" on account (as shown by Report Book) of			Number of these Births remaining neither duly entered in the "Vaccination Register" (cols. 3, 4, 5, and 6 of this Return) nor temporarily accounted for in the "Report Book" (cols. 8, 9, and 10 of this Return).
		Col. 10.	Col. 11.		Col. 13.		Postponement by Medical Certificate.	Removal to Districts the Vaccination Officer of which has been duly apprised.	Removal to places unknown or which cannot be reached; and cases not having been found.	
		"Successfully Vaccinated."	"Insusceptible of Vaccination."	"Had Smallpox."	"Dead, Unvaccinated."					
1	2	3	4	5	6	7	8	9	10	11
Birmingham Parish ...	8,318	5,962	36	—	1,168	9	103	43	569	428
Aston Union (within the City)	6,980	4,262	34	—	1,028	12	184	45	605	810
King's Norton Union (within the City) ...	1,783	1,241	17	—	177	16	19	19	118	176
Total	17,081	11,465	87	—	2,373	37	306	107	1,292	1,414

TABLE XIV.—WATER: RESULTS OF ANALYSIS EXPRESSED IN PARTS PER 100,000.

Date of Receipt of Sample.	DESCRIPTION.	Temperature, C.	Total Solid Matter.	Organic Carbon.	Organic Nitrogen.	Albuminoid Ammonia.	Free Ammonia.	Nitrogen as Nitrates and Nitrites.	Oxygen Absorbed in 4 hours, at 27°C (80° F.)	Previous Sewage Contamination. (Estimated).	Chlorine.	Hardness. Temporary.	Hardness. Permanent.	Hardness. Total.	REMARKS.
1898.	**CORPORATION SUPPLY.**														
Jan. 7th	10 Court, Lower Essex Street	6°7	27·2	·290	·060	·015	·000	·25	·17	2,180	1·6	7°0	12°5	19°5	Clear: pale green
Feb. 16th	Court between Nos. 4 and 5, Oozells Street North ...	8·3	41·3	·060	·030	·003	·000	·40	·01	3,680	2·5	15·5	16·5	32·0	Clear: pale blue
Mar. 11th	Rear of Nos. 13 and 14, Wyndham Road	5·5	33·4	·160	·020	·004	·000	·35	·06	3,180	2·3	9·5	14·0	23·5	Almost clear: pale green
April 16th	Back 105, Duddeston Mill Road	7·2	34·0	·260	·040	·010	·000	·20	·12	1,680	1·7	8·5	18·5	27·0	Clear: pale green
May 6th	Wellingt'n place, Kyrwick's lane	9·4	30·8	·200	·060	·019	·001	·35	·11	3,190	2·4	8·5	13·5	22·0	Slightly turbid: pale green
June 9th	20 and 22, Tudor Street ...	13·9	30·2	·260	·050	·017	·001	·30	·17	2,690	2·2	8·5	12·0	20·5	Very slightly turbid: pale green
July 19th	Court back of 75 and 76, Floodgate Street	18·9	25 6	·250	·080	·013	·002	·05	·10	200	1·9	6·0	10·5	16·5	Very slightly turbid; pale green
Aug. 17th	Court back of 108 and 110, Branston Street	16·7	31·2	·120	·030	·003	·000	·25	·08	2,180	2·6	6·0	13·5	19·5	Clear: pale green
Sept. 7th	Victoria Buildings, Northbrook Street	17·8	30·8	·170	·030	·004	·000	·20	·06	1,680	2·6	4·5	14·5	19·0	Ditto
Oct. 11th	14 Court, Ormond Street ...	12·8	32·0	·230	·030	·007	·001	·10	·12	690	2·1	5·5	14·5	20·0	Ditto
Nov. 14th	6 Court, Fisher Street... ...	10·0	34·8	·190	·030	·007	·004	·40	·09	3,710	2·8	6·0	13·5	19·5	Very slightly turbid; pale green
Dec. 6th	Rear of 3 and 5, York Street ...	7·8	34·8	·280	·040	·014	·001	·35	·15	3,190	2·6	4·0	17·0	21·0	Clear; pale green
	Average Results ...1898	11·2	32·2	·210	·040	·010	·001	·27	·10	2,350	2·3	7·5	14·2	21·7	
	,, ,, ...1897	10·4	32·0	·280	·040	·011	·000	·28		2,480	2·3	8·9	13·0	21·9	
	,, ,, ...1896	10·7	32·0	·250	040	·012	·001	·29		2,550	2·4	9·0	13·0	22·0	
	,, ,, ...1895	10·3	31·9	·219	·049	·018	·000	·22		1,890	2·3	9·2	13·7	22·9	
	,, ,, ...1894	10·9	30·3	·174	·046	·013	·000	·21		1,820	2·2	7·0	13·1	20·1	

WELL WATERS.

Jan.	5th	*29 to 40, Queen Street, Sparkbrook	...	142·0	...	...	·007	·095	3·50	·05	35,000	12·4	...	...	94·0	Very slightly turbid; pale blue
,,	18th	126, 128, and 130 in front, and 1 to 6. at back, Highgate Road	...	163·0	...	...	·011	·001	5·90	·09	59,000	10·4	...	...	133·0	Very slightly turbid; pale green
,,	18th	132, 134, and 136 in front, and 7 to 12 at back, Highgate Road	...	135·0	...	...	·007	·000	3·20	·06	32,000	9·0	...	...	118·0	Ditto
,,	31st	*256, 258, 260, 262, 264, and 266, Highgate Road	...	145·0	...	...	·011	·045	4·90	·05	49,000	12·0	...	...	112·0	Clear; pale green
Feb.	16th	2 to 12, Balden Road, Harborne, (second sample)	...	72·0	...	...	·006	·000	4·40	·02	44,000	6·2	...	...	39·0	Very slightly turbid; pale blue
Mar.	21st	*2 to 9, Alfred Street, Sparkbrook	...	220·0	...	...	·035	2·700	10·00	·19	122,000	17·5	...	...	125·0	Very slightly turbid; pale green
April	22nd	†1, 2, 3, 4, and 5, Prospect Terrace, Belgrave Street ...	...	145·0	...	...	·015	·001	4·60	·10	46,000	11·0	...	...	133·0	Ditto
,,	22nd	†Marten Place, Belgrave Street	...	145·0	...	...	·017	·000	5·70	·12	57,000	11·4	...	...	118·0	Ditto
,,	23rd	§122 and 123, Edwardes Street	...	200·0	...	...	·018	·001	7·90	·11	79,000	14·3	...	...	164·0	Very slightly turbid; green
May	2nd	18, Sherbourne Road	...	465·0	...	...	·012	·100	5·50	·07	55,000	110·0	...	...	330·0	Nearly clear; pale blue
Aug.	17th	1 to 4, Sandwell Place, George Street	...	133·0	...	...	·017	·001	6·00	·17	60,000	6·8	...	...	60·0	Very slightly turbid; greyish green
,,	31st	237, Pershore Road	...	70·0	...	...	·004	·001	0·75	·08	7,200	4·4	...	...	50·0	Very slightly turbid; grey
Sept.	9th	§*Greenfield Cottage, Banks Road	...	56·0	...	...	·055	·004	1·00	·26	10,000	1·8	...	...	51·0	Slightly turbid; grey
,,	21st	§*Hay Mill Farm	...	88·0	...	...	·010	·000	1·70	·05	17,000	5·8	...	...	78·0	Clear; pale green
,,	29th	180, Park Road, Hockley ...	...	150·0	...	...	·006	·002	6·90	·04	69,000	11·1	...	...	87·0	Very slightly turbid; pale green
Oct.	24th	*1 to 4 at the back of 102, Mary Street	...	169·0	...	...	·011	·003	4·40	·13	44,000	11·0	...	...	117·0	Ditto

* Diphtheria. † Typhoid Fever. § Scarlet Fever.

Table of the Number of Deaths occurring in each Street in the City of Birmingham during the Year 1898.

STREETS.	Zymotic Diseases	Other Diseases
A		
A B Row	1	2
Abberley Street		4
Abbey Road	2	4
Abbey Street		
Abbotsford Road		1
Aberdeen Street	3	18
Ada Road		1
Adams Street	5	28
Adderley Road	1	20
Adderley Street	2	8
Addison Road	1	1
Adelaide Street	3	13
Albany Road		1
Albert Road		
Albert Street		
Albion Street	1	6
Aleester Street	3	16
Alder Drive		
Alder Road		1
Alexandra Road		2
Alexandra Street		7
Alfred Street	2	2
Algernon Road		5
Allcock Street	3	6
Allen's Road	2	3
Allesley Street	1	8
Allison Street	2	11
Allport Street		
All Saints' Road	1	
All Saints' Street		
Alma Crescent	1	2
Alma Street		
Alston Street	1	9
Alum Rock Road	3	14
Ampton Road		2
Anderton Road		6
Anderton Street	2	13
Anderton Park Road		
Andover Street		1
Angelina Street	6	18
Anthony Road		1
Arden Road	2	4
Argyle Street	3	8
Arley Road		
Armoury Road	1	8
Arsenal Street		3
Arter Street		2
Arthur Road		
Arthur Street	8	22
Artillery Street	1	4
Ash Road	2	13
Ashford Street		5
Ashley Street	4	21
Ashted Row	2	11
Aston Road	1	28
Aston Street		8
Aston Brook Street	2	8
Aston Church Road	1	7
Asylum Road		3
Athole Street		1
Atlas Road		2
Auckland Road	1	8
Augusta Street	2	2
Augustus Road		2
Austin Street		6
Avenue Road		
B		
Bacchus Road	1	4
Bagot Street	3	6
Bailey Street		
Baker Street		3
Balden Road		1
Balfour Street		1
Balsall Heath Road	4	28
Banbury Street		4
Banks Road		
Barford Road	1	10
Barford Street	8	28
Barker Street	2	6
Barlow's Road		
Barn Street	2	1
Barnsley Road		
Barr Street	4	15
Barrack Street	1	
Barrows Road		2
Bartholomew Row		2
Bartholomew Street	1	9
Barwell Road	1	1
Barwick Street		
Baskerville Passage		
Baskerville Place		
Bath Passage		1
Bath Row	3	11
Bath Street		2
Beach Street	5	8
Beaconsfield Road		
Beak Street	1	2
Beaufort Road		3
Bedford Road	1	2
Beech Lanes	2	1
Beechfield Road	2	3
Belcher Lane		1
Belgrave Road	6	19
Belgrave Street		4
Bell Street		1
Bell Barn Road	11	32
Bellefield Road	2	3
Bellis Street		4
Belmont Passage		3
Belmont Row	1	2
Benacre Street	4	17
Bennett's Hill		2
Benson Road	5	8
Berkley Street		
Berners Street		1
Berry Street		3
Bertram Road		2
Betholom Row		
Birchall Street	1	6
Birchwood Road	1	3
Bird Lane		1
Bishop Street	4	14
Bishopsgate Street	8	14
Bissell Street	3	17
Black Pit Lane		
Blake Lane	1	2
Blakeland Street		8
Blews Street		12
Blews Street West		
Bloomsbury Street	5	17
Blucher Street	3	8
Blythe Street		11
Bolton Road	6	37
Bolton Street		2
Bond Street		
Bordesley Green	3	14
Bordesley Green Road	1	4
Bordesley Park Road	7	22
Bordesley Street	1	11
Bow Street	2	5
Bowyer Street		1
Bowyer Road		5
Bracebridge Street	1	14
Bradford Street	4	25
Braithwaite Road		1
Branston Street		6
Brass Street	1	2
Brasshouse Passage		2
Bread Street		
Brearley Street	6	57
Brewery Street		
Brickiln Street		
Bridge Road		1
Bridge Street		
Bridge Street West	9	36
Brighton Road	4	4
Bristol Road		4
Bristol Street	3	8
Brixham Road		
Broad Street		14
Bromford Lane		
Bromley Street	3	4
Bromsgrove Street	1	18
Brook Road		1
Brook Street		
Brookfield Road	1	5
Broom Street	2	2
Browning Street	2	12
Brueton Street	1	
Brunswick Road	5	19
Buck Street	1	3
Buckingham Street		7
Bull Ring		4
Bull Street, Harborne		2
Bull Street, Market Hall		
Bullock Street		1
Burbury Street		4
Burlington Passage		
Burlington Road		4
Burney Lane		
Butler Street	1	3
Butler Street South		3
Butlin Street		1
Byron Road	1	12
C		
Calthorpe Road		5
Cambridge Crescent		1
Cambridge Street		
Camden Drive		2
Camden Grove		1
Camden Street	13	38
Camp Hill	1	8
Camp Street		7
Canal Street	3	5
Cannon Street		
Cannon Hill Road	1	2
Cape Street	2	3
Cardigan Street		11
Carlisle Street	1	7
Carlton Road	1	11
Carlyle Road		2
Carnarvon Road		
Caroline Street		3
Carpenter Road		
Carrington Road		8
Carr's Lane		
Cartland Road		2
Carver Street	2	6
Castle Street		
Catheart Street	1	8
Cato Street	3	14
Cato Street North		2
Cattell Road	2	17
Cattell Grove	1	3
Cavendish Road		1
Cecil Street	1	14
Chad Road		3
Chandos Road		1
Chapel Street		2
Chapel House Street		4
Chapman Road		1
Charles Road		7

STREETS.	Zymotic Diseases	Other Diseases.
Charles Arthur Street ..	3	16
Charles Henry Street ..	5	29
Charlotte Road ..		2
Charlotte Street ..		1
Chattaway Street ..	1	1
Cheapside .. .	5	35
Cheatham Street ..		1
Chequers Walk ..	2	3
Cherry Street		1
Cherry Wood Road ..	1	13
Chester Street.. ..	1	11
Chesterton Road ..	4	16
Cheston Road ..	1	1
Chicheley Street ..		2
Chiswell Road ..		3
Christ Church Passage		
Church Lane		
Church Road		
Church Street.. ..		1
City Road	1	4
Claremont Road ..		1
Clarence Road ..		5
Clarendon Road ..		5
Clark Street	4	16
Claverdon Street ..	1	10
Claybrook Street ..		6
Clayton Road		1
Clement Street ..		4
Cleve Terrace ..		1
Clevedon Road ..	2	11
Clifton Road	7	20
Clissold Street ..	1	8
Clive Passage.. ..		
Cliveland Street ..	1	3
Clyde Street ..		7
Coleman Street ..	3	12
Coleshill Street ..	1	13
College Road	1	3
College Street		4
Colmore Row		4
Colville Road.. ..	4	10
Commercial Street ..		
Common Lane.. ..		
Communication Row .		2
Congreve Street ..		1
Constance Road ..		
Constitution Hill ..	1	8
Conway Road		
Conybere Street ..	2	15
Cook Street		9
Cooksey Road ..	2	34
Cope Street	2	3
Coplow Street ..	2	12
Coralie Street ..	1	3
Cornwall Street ..		
Coronation Road ..		
Corporation Street ..		2
Cotterill's Lane ..	1	3
Couchman Road ..		4
Court Road		
Court Oak Road ..		1
Coventry Road ..	3	32
Coventry Street ..		12
Cowper Street ..	3	13
Cox Street	1	4
Cox Street West ..	4	10
Coxwell Road ..		2
Crabtree Road ..	1	5
Cradock Road.. ..		1
Cranbury Street ..		2
Cranby Street.. ..		7
Cranford Street ..		
Cranemore Street ..		4
Crawford Street ..	1	5
Cregoe Street	2	19
Crescent		3
Cromer Road ..		1
Crompton Road ..		4
Cromwell Passage ..		
Cromwell Street ..	7	41
Crooked Lane		
Crosbie Road		
Cuckoo Road		19
Cumberland Street ..	1	2
Curzon Street	1	2
Cuthbert Road ..	1	5
Cyril Road		6
D		
Daisy Road		5
Dale End		1
Dalton Street		
Darnley Road ..		
Dart Street		1
Dartmouth Street ..	1	18
Darwin Street ..	12	30
Dawson Street ..		1
Dean Street		
Dearman Road	1	3
Defford Road		2
Denbigh Street ..	1	5
Dennis Road		1
Derby Street . ..	2	6
Devon Street	8	25
Devonshire Street ..	2	17
Digbeth	2	10
Digby Street		
Dixon Road	1	4
Doe Street	1	2
Dolman Street ..		11
Dolobran Road ..	1	12
Don Street	4	7
Dora Road		1
Dorset Road		
Dover Street		2
Dr. Johnson Passage ..		
Drayton Road.. ..		
Drew's Lane		1
Drury Lane	1	2
Dryden Road		
Duchess Road.. ..		2
Duddeston Row ..		8
Duddeston Mill Road ..	9	17
Dudley Road	1	30
Dudley Street		
Dugdale Street ..	1	7
Duke Street		15
Dymoke Street ..	5	12
E		
Earl Street		1
Eastern Road		
Easy Row		1
Eden Place		
Edgbaston Road ..		3
Edgbaston Park Road..		
Edgbaston Street ..		
Edmond Road.. ..		
Edmund Street ..		8
Edward Road		1
Edward Street ..	1	12
Edwardes Street ..	2	19
Eldon Road	1	1
Eliot Street	1	4
Elkington Street ..	1	2
Ellen Street	4	19
Ellis Street		6
Elvetham Road ..		2
Emerson Road ..		
Emily Street	7	20
Emmeline Street ..		
Enfield Road		
Erasmus Road ..	1	7
Ernest Road	1	1
Erskine Street.. ..	2	5
Essex Street .. .		4
Essington Street ..	2	17
Ethel Road		
Ethel Street		
Eton Road		2
Eva Road	4	9
Eversley Road ..	5	9
Exeter Street		
Eyre Street	2	13
F		
Factory Road		5
Falconer Road ..		
Fallows Road ..	1	4
Farm Road		2
Farm Street	14	37
Farquhar Road ..		1
Farquhar Road East ..		
Fawdry Street		
Fazeley Street ..	1	11
Fellows Lane		
Fisher Street		11
Fleet Street		
Floodgate Street ..	1	15
Florence Street ..	2	5
Ford Street	6	17
Fordrough Lane ..		
Fordroughs		
Fore Street		
Forge Street		
Forster Street.. ..	1	
Foundry Road ..		5
Fowler Street		1
Fox Street		5
Francis Road		4
Francis Street ..	5	18
Frank Street		6
Frankfort Street ..	4	12
Franklin Street ..		6
Frederick Road ..		3
Frederick Street ..		1
Freeman Road ..		8
Freeman Street ..		
Freeth Street	3	10
Friston Street ..	1	15
G		
Galton Street	1	3
Garbett Street ..	2	9
Garrison Lane ..	3	19
Garrison Street ..	2	18
Gas Street		1
Gate Street	1	3
Geach Street		8
Gee Street	1	1
Gem Street		4
George Road		10
George St., Balsall H'th		13
George Street, St. Paul's		1
George Street West ..		18
Gibb Street	2	3
Gillhurst Lane ..		
Gillott Road		6
Gladstone Road ..		5
Glebe Street		1
Gloucester Street ..		
Glover Road ..	2	3
Glover Street ..	2	18
Godwin Street.. ..	1	11
Golden Hillock Road ..	1	5
Gooch Street	2	25
Goode Street		5
Goodman Street ..		
Goodrick Street ..	1	4
Gopsall Street ..		2
Gordon Road	1	3
Gordon Street	1	6
Gosford Street ..	1	
Gosta Green	1	2
Gough Road		9
Gough Street		3
Grace Road		8
Grafton Road		1
Graham Street ..		6
Grange Rd.		11
Grant Street	2	7
Grantham Road ..	1	5
Granville Street ..		10

STREETS.	Zymotic Diseases.	Other Diseases.
Gray Street .. .		1
Gray's Road		5
Great Barr Street ..		9
Great Brook Street ..	1	25
Great Charles Street ..		4
Great Colmore Street ..	1	21
Great Francis Street ..	10	37
Great Hampton Row ..		14
Great Hampton Street..		9
Great King Street ..	3	19
Great Lister Street ..	3	31
Great Russell Street ..	10	29
Great Tindal Street ..	1	13
Green Lane	6	28
Green St., Deritend ..		1
Green Street, Saltley ..	1	1
Greenfield Crescent ..		1
Greenfield Road ..	1	6
Greenway Street ..	3	11
Grosvenor Road ..		1
Grosvenor Row .		
Grosvenor Street ..		
Grosvenor Street West	5	23
Grove Lane	1	
Grove Street ..		
Guest Street ..	1	5
Guildford Street ..	2	12
Guthrie Street ..		
H		
Hack Street		1
Haden Street		3
Hadley Street.. ..	1	2
Hagley Road		11
Halberton Street ..	2	1
Hall Road		2
Hall Street		1
Hallam Street ..	2	6
Hampden Street ..		2
Hampton Street ..		14
Handsworth New Road		2
Hanley Street ..		12
Hanover Street ..		3
Harborne Road ..		6
Harborne Park Road ..	1	3
Harding Street ..		9
Harford Street ..	1	5
Harold Road	1	2
Harris Road		1
Harrison's Road ..		3
Hart Street		
Hart's Road		1
Hatchett Street ..	2	17
Havelock Road ..	1	4
Hawkes Street ..		8
Hawthorn Road ..		
Heath Green Road ..	1	2
Heath St.	9	34
Heath Street South ..		1
Heath Mill Lane ..	5	17
Heaton Street	5	18
Helena Street	2	1
Heneage Street ..	5	41
Henley Street		13
Henn's Walk		
Henrietta Street ..		1
Henry St.	1	16
Henshaw Road ..	1	6
Herbert Road	7	21
Hermitage Road ..		
Hertford Road ..		4
Hick Street		6
Hickman Road ..		2
Hicks Square		1
High Street		6
High Street, Bordesley and Deritend ..	1	16
High St., Harborne ..		25
High St., Saltley ..	2	5
Highfield Rd., Edgb'ton		2
Highfield Rd., H'Lorne		4
Highfield Rd., Saltley..	3	6
Highgate Place ..		2
Highgate Road ..	10	24
Highgate Square ..		
Highgate Street ..	7	17
High Park Street ..	3	5
Hill Street	2	6
Hinckley Street ..		
Hingeston Street .	5	19
Hobmoor Road .		5
Hockley Hill		11
Hockley Street ..		5
Holborn Hill	1	4
Holder Road		
Holland Street ..		2
Holliday Street ..	2	11
Hollier Street	1	6
Holloway Head ..	3	8
Holly Road		1
Holt Street	4	8
Homer Street	1	3
Hooper Street.. ..		3
Hope Street	6	22
Horse Fair	1	2
Hospital Street ..	7	38
Howard Street ..		3
Howe Street	1	3
Hubert Street ..		3
Hugh Road		4
Humpage Road ..		3
Hunter's Road ..		2
Hunter's Vale		
Hurst Street	3	18
Hutton Road		
Hutton Street		
Hyde Road		4
Hylton Street	1	
I		
Icknield Square ..	3	5
Icknield Street ..	4	18
Icknield Port Road ..	9	31
Inge Street	3	5
Ingleby Street ..	1	5
Inkerman Street ..	1	14
Irving Street	3	26
Islington Row.. ..		6
Ivy Lane	1	2
J		
Jakeman's Road ..	2	7
Jakeman's Walk ..	3	3
Jamaica Row		
James Street		1
James Turner Street ..		4
James Watt Street ..		
Jenkins Street ..		3
Jennens Row		4
Jersey Road		3
John Bright Street ..	1	4
Johnson Street ..		4
Johnstone Street ..		4
K		
Keeley Street		
Kendal Road		2
Kenelm Road	1	9
Kent Street		5
Kent Street North ..		9
Kenyon Street ..	5	10
Key Hill		7
King Street		
King Alfred's Place ..		2
King Edward's Place ..		
King Edward's Road ..	4	16
Kingsecte Road.. ..		
Kingsley Road ..		1
Kingston Road ..		1
Kingswood Road ..		2
Knutsford Street ..	1	4
Kyott's Lake Road ..		3
Kyrwick's Lane ..	2	11
L		
Ladypool Road ..	5	25
Ladywell Passage ..		1
Ladywell Walk ..	1	
Ladywood Road ..	4	15
Lancaster Street ..	2	10
Landor Street		5
Langley Road ..		7
Lansdowne Street ..		2
Larches Street ..	5	7
Latimer Street ..	4	18
Lawden Road ..		8
Lawford Street ..	3	7
Lawley Street ..	1	32
Lawrence Street ..		5
Lawson Street ..		1
Leach Street		3
Leamington Road ..	4	5
Lease Lane		
Ledsam Street ..	5	19
Lee Bank Road ..	4	24
Lee Crescent .. .		2
Lee Mount		
Leek Street	1	
Lees Street	1	10
Legge Lane		1
Legge Street		5
Leigh Road		1
Lench Street		
Lennox Street ..	2	10
Leonard Street ..		2
Leopold Street ..	5	12
Leslie Road		1
Lilly Green		
Lime Grove		1
Lincoln Street ..		9
Lingard Street ..	5	9
Link Road		
Lionel Street	1	3
Lister Street		5
Little Ann Street ..		8
Little Barr Street ..		4
Little Bow Street ..		1
Little Broom Street ..		1
Little Edward Street ..		2
Little Francis Street ..		
Little Green Lane ..	5	19
Little King Street ..	1	8
Little Shadwell Street..		
Liverpool Street ..		1
Livery Street		1
Lloyd Street		
Lodge Road	2	22
Lombard Street ..		8
Long Acre	6	26
Long Street	2	10
Longbridge Road ..	2	3
Longmore Street ..	2	8
Lonsdale Road ..	1	
Lord Street	3	10
Lordswood Road ..		7
Louisa Street		1
Love Lane	1	
Loveday Street ..		3
Lowe Street		1
Lower Dartmouth Street	3	7
Lower Darwin Street ..		1
Lower Essex Street ..	2	11
Lower Loveday Street..		3
Lower Priory ..		
Lower Temple Street ..		
Lower Tower Street ..	5	34
Lower Trinity Street .	1	9
Loxton Street.. ..	1	1

STREETS.	Zymotic Diseases	Other Diseases
Ludgate Hill		
Ludgate Hill Passage ..		
Lupin Street		12
Lyttelton Road ..		
M		
Macdonald Street	2	5
Main Street		9
Malins Road		1
Malthouse Lane ..	2	1
Malvern Street ..		5
Malvern Hill Road ..		3
Manchester Street ..	1	4
Manor Road		
Margaret Road ..		2
Margaret Street ..		
Mark Lane		
Markby Road		1
Market Street		3
Marlborough Road ..		
Marroway Street ..	3	8
Marshall Street ..		4
Marshall Street South ..	2	2
Martineau Street ..		1
Mary St., Balsall Heath	4	18
Mary Street, St. Paul's		
Mary Ann Street ..		2
Masshouse Lane ..		4
Maxstoke Street ..	1	2
Meadow Road		
Medlicott Road ..	1	1
Melville Road		1
Meriden Street ..	2	11
Metchley Lane ..	1	6
Metchley Park Road ..		
Metropolitan Road ..		1
Midland Street ..	1	4
Miles Street	4	10
Milk Street	3	9
Mill Lane, Harborne ..		
Mill Lane, St. Martin's		4
Mill Lane, Ward End ..		
Mill Street		5
Miller Street .. .	3	22
Mills Lane		
Milton Street	1	6
Milward Street ..		6
Minories		
Moat Lane		1
Moat Row		1
Moilliett Street ..	2	9
Moland Street ..	3	16
Mole Street	4	11
Mona Road		1
Montague Road ..		1
Montague Street ..		1
Montgomery Street ..	2	11
Montpellier Street ..		1
Monument Road ..	2	26
Moor Street		6
Moore's Row		1
Moorsom Street ..	3	15
Moreton Street ..	1	1
Morville Street ..	1	14
Moseley Road	2	36
Moseley Street ..	6	34
Mostyn Road		
Mott Street		13
Mount Pleasant ..		3
Mount Street	1	4
Muntz Street		9
Musgrave Road ..		6
N		
Navigation Street ..		3
Nechells Park Road ..	3	16
Nechells Place ..		3
Needham Street ..		1
Needless Alley ..		
Nelson Street ..	4	7
New Street		5
New Bartholomew St. ..		2
New Bond Street .		2
New Brunswick Road ..		
New Canal Street ..	1	12
Newdegate Street ..		1
Newhall Hill		3
Newhall Street ..	1	14
New John Street ..	1	23
New John Street West ..	6	56
New Market Street ..		
New Meeting Street ..		
Newport Road ..	1	3
New Spring Street ..	2	14
New Summer Street ..	9	27
Newton Road		
Newton Street ..		1
Newtown Row ..	4	20
Nile Street		
Nineveh Road		
Noel Road		1
Norfolk Road		1
Norman Street ..	4	10
Northampton Street ..		
North Road	1	9
Northbrook Street ..	1	7
Northfield Road ..		3
Northumberland Street	1	7
North Warwick Street ..		
Northwood Street ..	3	4
Norton St.	1	7
Norwood Road ..		2
Nova Scotia Street ..	1	5
Nursery Road		1
O		
Oakfield Road ..		5
Oakley Road		2
Old Square		1
Old Church Road ..		
Old Cross Street ..		1
Oldfield Road	7	17
Old Meeting Street ..		
Oliver Road		1
Oliver Street .. .	2	6
Ombersley Road ..	5	13
Oozells Street		1
Oozells Street North ..		4
Orchard Road	1	3
Orford Road		1
Ormond Street ..		5
Osborn Road .. .	2	4
Osler Street	2	17
Oughton Place ..		
Outlet Road		
Owen Street	4	4
Oxford Street	1	5
Oxygen Street		
P		
Paddington Street ..	1	10
Paignton Road ..	1	1
Pakenham Road ..		
Palace Road		5
Palmer Street	2	9
Palmerston Road ..		1
Parade		1
Paradise Street ..		
Park Hill Road ..		3
Parkfield Road ..		1
Park Lane		3
Park Road	2	33
Park Street		8
Parker Street	1	5
Parliament Street ..	4	8
Paternoster Row ..		
Paxton Road	1	2
Pebble Mill Road ..		
Peel Street	4	14
Pemberton Street ..		2
Pembroke Road ..		3
Penn Street		4
Percival Road		1
Perrot Street		6
Pershore Road ..		11
Pershore Street ..	1	10
Phillimore Road ..	1	5
Phillip Street .		
Pickford Street ..		11
Piddock Street ..		4
Pigott Street	1	2
Pinfold Street		
Pitney Street		
Pitsford Street ..	1	2
Pitt Street		1
Plough & Harrow Road		2
Plume Street		
Pope Street	7	18
Poplar Avenue ..	1	3
Poplar Road		
Porchester Street ..		3
Porthope Road ..	2	2
Portland Road ..		1
Potter Street		2
Powell Street		8
Prescott Street ..	2	10
Preston Road	1	4
Price Street	1	9
Priestley Road ..	1	3
Prince Albert Street ..		4
Prince Arthur Road ..	2	4
Princes Row		3
Princes Street		1
Princess Road		8
Princess Street ..		
Princip Street		5
Priory Road ..		3
Pritchatt's Road ..		
Pritchett Street ..	1	21
Proctor Street	1	9
Prospect Row		4
Q		
Queen Street	2	4
R		
Radnor Street		1
Raglan Road	3	
Railway Terrace ..		5
Ralph Road		
Rann Street		7
Ravenhurst Road ..		6
Ravenhurst Street ..		6
Rawlins Street ..		5
Raymond Road ..		1
Rea Street		14
Rea Street South ..		4
Regent Parade ..		
Regent Place	1	1
Regent Road	1	2
Regent Row		1
Regent Street		
Regent Park Road ..		4
Reginald Road ..	1	12
Reservoir Retreat ..		
Reservoir Road ..	1	4
Richard Street ..	2	14
Richmond Hill Road ..		
Ridley Street .. .	2	3
River St., Balsall Heath		2
River St., St. Barthol'w's		1
Robert Road	1	
Rocky Lane	2	7

STREETS.	Zymotic Diseases.	Other Diseases.
Rodway Street ..		1
Rosalie Street		4
Rose Road		3
Rosebery Street ..	1	4
Roshven Road ..	1	3
Rotton Park Road ..	1	4
Rotton Park Street ..		
Rowland Street ..		3
Runeorn Road ..	2	7
Rupert Street	1	11
Ruston Street	2	15
Ruston Street North ..	1	3
Rutland Road		
Ryder Street		4
Ryland Road		12
Ryland Street .. .		8
S		
Salop Street		3
Saltley Road . ..	3	27
Saltley Street	1	3
Sampson Road ..	1	7
Sampson Road North ..	1	5
Sand Pits	1	1
Sand Street		
Sandon Road		3
Sandy Lane	2	9
Sarah Street		
St. Andrew's Road ..	10	28
St. Augustine's Road ..		
St. Clement's Road ..	1	1
St. George's Place ..		2
St. George's Street ..	3	18
St. James' Place ..		1
St. James' Road ..		
St. James' Street ..	1	7
St. John's Road ..		
St. Luke's Road ..	3	12
St. Margaret's Road ..		1
St. Mark's Street ..	2	18
St. Martin's Lane ..		
St. Martin's Place ..		3
St. Martin's Row ..		
St. Martin's Street ..	2	9
St. Mary's Road ..		1
St. Mary's Row ..		1
St. Mary's Street ..	1	6
St. Oswald's Road ..		
St. Paul's Road ..	1	6
St. Paul's Square ..		
St. Peter's Place ..		
St. Peter's Road ..		1
St. Philip's Place ..		
St. Saviour's Road ..	1	7
St. Stephen's Street ..	1	2
St. Vincent Street ..	2	19
Scholefield Street ..	2	17
Scotland Street ..	1	1
Scot Street		2
Sefton Road		
Selly Park Road ..		1
Selwyn Road		
Serpentine Road ..		3
Severn Street	1	1
Seymour St., B's H H'th	1	3
Seymour St., St. Barth.		
Shadwell Street .		3
Shakespeare Road .	4	11
Sheep Street	1	11
Sheepcote Lane ..		7
Sheepcote Street ..	3	9
Shefford Road ..	1	1
Shenstone Road ..		3
Sherborne Street ..	2	24
Sherbourne Road ..	11	15
Sherlock Street ..	6	36
Sir Harry's Road ..		
Skinner Lane	1	4
Skinner Street .		1
Sladefield Lane ..		
Slaney Street		1
Sloane Street	1	6
Slough Lane		3
Smallbrook Street ..	1	3
Smith Street ..	2	3
Smithfield Passage ..		1
Smithfield Street ..		1
Snow Hill		9
Somerset Road ..		
Somerset Street ..		6
Somerville Road ..		
South Road	4	6
South Street		1
Spark Street	1	2
Speaking Stile Walk ..		
Speedwell Road ..		
Spencer Street ..		7
Spiccal Street		
Spon Terrace		
Spooner Street ..	1	1
Spring Hill	3	13
Spring Hill Passage ..		5
Spring Road		1
Spring Street		6
Spring Vale	1	
Springfield Street ..	3	13
Stafford Street ..		
Stanhope Street ..	1	9
Staniforth Street ..	3	8
Stanley Road	1	
Stanmore Road ..		2
Station Road ..		3
Station Street		
Stechford Lane ..		
Steelhouse Lane ..		2
Stella Street		4
Stephenson Place ..		
Stephenson Street ..		
Steward Street ..	2	14
Stirling Road ..		2
Stoke Street		4
Stone Yard		1
Stoney Lane	1	7
Stour Street	2	13
Stratford Place ..		3
Stratford Road ..	1	9
Stratford Street ..		5
Strensham Road ..		
Stuart Street		4
Studley Street ..	4	6
Suffolk Street	3	8
Summer Lane	4	37
Summer Road		14
Summer Row .. .		
Summer Street ..		
Summerfield Crescent ..		3
Summer Hill Road ..		1
Summer Hill Street ..	3	11
Summer Hill Terrace ..		1
Somerville Road ..		4
Sun Street		9
Sun Street West ..	1	4
Sutton Street		4
Swallow Street ..		
Sydenham Road ..	1	11
Sydney Road		4
T		
Talbot Street	7	3
Talfourd Street ..	6	20
Taunton Road	1	4
Taylor Street	1	2
Temple Row		
Temple Row West ..		
Temple Street		2
Templefield Street ..		2
Tenby Street	1	
Tenby Street North ..		4
Tennal Lane		
Tennal Road		1
Tennant Street ..	2	13
Tennyson Road ..		1
Theodore Street ..		6
Theresa Road		
Thimble Mill Lane ..	2	9
Thomas Street ..	1	2
Thorp Street	1	4
Tibbetts Lane		2
Tillingham Street ..		4
Tilton Road	6	14
Tindal Street	1	7
Tower Street	8	21
Trafalgar Road ..		
Treaford Lane ..		
Trent Street		3
Trevor Street	1	12
Trinity Terrace ..		
Tudor Street	2	6
Turk's Lane		
Turner Street	1	3
Twyning Road ..		2
U		
Unett Street ..	3	16
Union Passage ..		
Union Street		
Union Terrace ..		
Upper Cox Street ..		5
Upper Dean Street ..		1
Upper Gough Street ..	1	10
Upper Highgate Street	4	13
Upper Marshall Street ..		1
Upper Mill Lane ..		1
Upper Priory	1	
Upper Ryland Road ..	1	5
Upper Trinity Street ..		12
V		
Varna Road		7
Vaughton Street ..	4	22
Vaughton Street South		
Vauxhall Grove ..		1
Vauxhall Road ..	3	28
Vauxhall Street .		1
Venetia Road		3
Ventnor Road		1
Vere Street		6
Vernon Road		2
Vesey Street		
Viaduct Street		
Vicarage Rd., Edgbaston		
Vicarage Rd, H'borne ..		
Victoria Grove ..		1
Victoria Road ..		
Victor Road	1	1
Victoria Street ..	1	7
Villa Street		1
Villiers Street	1	
Vincent Crescent ..		4
Vincent Parade ..	6	4
Vincent Street ..	3	9
Vine Street	1	
Vittoria Street . ..	1	1
Vivian Road	3	10
Vyse Street	1	3

STREETS.	Zymotic Diseases.	Other Diseases.
W		
Walford Road		3
Walter Street	1	3
Ward End		3
Ward Street		5
Warner Street		
Warren Road		
Warstone Lane ..	2	14
Warstone Parade East ..		
Warwick Street ..	5	19
Washington Street ..		1
Washwood Heath Road	3	12
Water Street	1	1
Waterloo Street ..	1	3
Waterworks Road ..		4
Watery Lane	5	27
Watts Road		1
Waverley Road ..		2
Weaman Row		
Weaman Street ..	1	16
Well Lane		
Well Street	2	22
Wellesley Street ..		7
Wellington Road	1	6
Wellington Street ..	4	14
Wenman Street ..	2	8
Wentworth Road ..		2
Westbourne Road ..		3
Western Road		1
Westfield Road ..		1
Westley Street ..	5	5
Weston Street		5
Wharf Lane		1
Wharf Street	1	8
Wharton Street ..		5
Wheeler Street ..	2	14
Wheeley's Lane ..	2	4
Wheeley's Road ..	1	2
Whitby Road		
White Road	1	6
White Lion Passage ..		
White Street		2
Whitehall Road ..	3	4
Whitmore Road ..	1	11
Whitmore Street ..	2	10
Whittall Street ..		2
Wiggin Street ..		1
William Street ..	3	14
William Street North ..		3
William Edward Street	1	12
William Henry Street ..	2	5
Willis Street	3	15
Willows Avenue ..		
Willows Crescent ..		
Willows Road	3	4
Wilton Street		6
Windmill Street ..		
Windsor Street ..	6	27
Winson Green Road ..	1	14
Winson Street... ..	1	8
Witton Street	1	8
Wolseley Street ..	1	7
Wood Lane		1
Wood Street		1
Woodbourne Road ..		
Woodcock Street ..	2	10
Woodfield Road ..	1	7
Woodville Road ..		
Worcester Street ..		1
Wordsworth Road ..	1	3
Wrentham Street ..	4	14
Wright Road	1	6
Wright Street	1	4
Wrottesley Street ..		
Wyndcliffe Road ..		3
Wyndham Road ..		3
Wynn Street	1	11
X		
Y		
Yardley Road		8
Yateley Road		
Yew Tree Road ..		
York Passage		
York Road		2
York Street		3
Z		
AT INSTITUTIONS.		
Children's Hospital ..	18	55
Queen's Hospital ..	14	149
General Hospital ..	29	333
City Hospital	36	5
Workhouse	33	696
City Asylum		110
St. Joseph's Home ..	1	28
Gaol		3
Eye Hospital ..		1
Blind Institution ..		
Homœopathic Hospital ..		12
Orthopædic Hospital ..		4
ADDENDA.		
Canals		20
Railways		5
Not located		2
TOTALS ..	1400	8536

Grand Total ... 9936

REPORT

ON

ADULTERATION.

City Analyst's Laboratory,

The Council House, Birmingham,

March 8th, 1899.

To the Health Committee.

Mr. Chairman and Gentlemen,

I beg to report that during the year 1898 I received for analysis 1,146 samples of food, drink and drugs. Two samples were submitted by Mr. Parker, Inspector of Nuisances, and the remainder by Mr. H. I. Jones, the Food and Drug Inspector under the Acts.

In the following table the samples analysed under the Food and Drugs Acts during 1897 and 1898 are divided into three classes, the adulterated articles being separated into those adulterated with preservatives only and those adulterated in other ways. The number of samples analysed under the provisions of the Margarine Act is also given.

Table A.—Total Samples.

	Number analysed.		Number adulterated. Preservatives only.		Other ways.	
	1897	1898	1897	1898	1897	1898
Samples of Food ...	979	1,043	119	104	120	88
Samples of Drink ...	38	55	3	2	3	2
Samples of Drugs ...	108	27	0	0	20	7
Samples under the Margarine Act ...	20	21	0	0	19	21
Total Samples ...	1,145	1,146	122	106	162	118

Last year there was an increase in the number of samples of food and drink received, but owing to the issue of a new British Pharmacopœia, a decrease in the number of samples of drugs.

The 1,146 samples analysed equal one sample for every 445 of the population of Birmingham. The average of the five years 1892-6 was one per 458 persons.

In 1897 eleven per cent. of the samples were adulterated with preservatives only and fourteen per cent. were adulterated in other ways; last year the figures were nine and ten per cent. respectively, showing an improvement under both headings.

The Report of the Local Government Board for 1897 shows that twelve per cent. of the samples examined in London and nine per cent. of the total samples examined in England and Wales were reported to be adulterated; the figures, however, are not exactly comparable, as in that Report samples taken under the Margarine Act appear to be counted as genuine, and no statement is made of the number of articles condemned because of the presence of preservatives.

The following table gives comparative figures for the total samples analysed during twenty-six years:—

TABLE B.—SAMPLES UNDER THE FOOD AND DRUGS, AND MARGARINE ACTS.

Years.	Samples per Annum.	Percentage of Adulteration.		Cautions per Annum.	Prosecutions per Annum.	Fines per Annum.		
		Preservatives only.	Other ways *			£	s.	d.
1873-76	83	1	47	2	13	8	16	3
1877-81	175	1	24	3	18	22	19	0
1882-86	616	0	16	31	35	30	7	1
1887-91	836	0	13	24	34	53	2	5
1892-96	1,074	3	11	40	72	110	5	6
1892	969	1	13	51	54	44	17	0
1893	1,004	1	12	49	49	51	8	0
1894	1,129	1	10	27	68	120	6	0
1895	1,131	0	11	31	86	124	18	6
1896	1,138	11	10	44	101	209	18	0
1897	1,145	11	14	39	126	257	17	0
1898	1,146	9	10	32	97	269	18	6

* Includes samples taken under the Margarine Act.

The large increase in the percentage of adulteration with preservatives only in 1896 was due to the commencement in that year of the systematic examination of all samples of butter and milk for preservatives. Last year was rather better than the previous two years in this respect.

In only one year has the percentage of adulteration other than by preservatives been lower than ten per cent.—the figure for 1898—and that was in 1886, when eight per cent. of the samples were thus adulterated. The average for 1892–6 was eleven per cent.

Rather fewer prosecutions were undertaken last year than in the previous two years; but, in spite of this fact, the amount of the fines paid by adulterators was larger than in any previous year.

I.—SAMPLES OF FOOD AND DRINK.

The following table gives a list of the samples of food and drink taken under the provisions of the Food and Drugs Acts and shows the number of each article found to be adulterated. The corresponding list of drugs is given in table J.

TABLE C.—SAMPLES OF FOOD AND DRINK.

	No. of Samples Analysed.	No. found to be Genuine.	No. found to be Adulterated.
Milk	449	358*	91†
Butter	326	238	88‡
Coffee	91	83	8
White Pepper ...	34	34	0
Bread	32	32	0
Flour	32	32	0
Self-Raising Flour ...	22	17	5
Demerara Sugar ...	27	27	0
Granulated Sugar ...	5	5	0
Vinegar	11	11	0
Oatmeal	8	8	0
Root Ginger	5	5	0
Ground Rice	1	1	0
Scotch Whiskey ...	14	13	1
Irish Whiskey ...	8	8	0
Sherry	12	11	1
Ale	11	10	1
Beer	7	7	0
Gin	3	2	1
TOTAL ...	1,098	902	196

* 57 of these were of low quality.
† 40 samples were adulterated with preservatives only.
‡ 64 samples were adulterated with boric acid only.

MILK.

Out of 449 samples ninety-one, or twenty per cent., were certified to be adulterated. Twenty-eight samples were adulterated with water, sixteen were deprived of part of their fat, and seven others contained both too much water and too little fat, the total being fifty-one samples, or eleven per cent. adulterated in these ways. Thirteen samples were condemned because of the presence of boric acid, and twenty-seven others contained formic aldehyde, forty samples, or nine per cent., being adulterated with preservatives only.

The number of samples of milk analysed was equivalent to one sample for every 1,137 persons living in Birmingham.

The average composition of the 443 samples of genuine and adulterated samples sold as "milk" was 12·4 per cent. of solid matter, of which 3·9 per cent. was fat; this is rather higher than in 1897 when the corresponding figures were 12·2 per cent. of total solids and 3·7 per cent. of fat. In the following table these samples are arranged according to the percentage of total solids found in them.

TABLE D.—COMPOSITION OF SAMPLES OF MILK.

Percentage of total solids.		Number of milks.		Percentage of total milks.
7—	...	1	...	0·2
8—	...	4	...	0·9
9—	...	4	...	0·9
10—	...	17	...	3·8
11—	...	85	...	19·2
12—	...	247	...	55·8
13—	...	67	...	15·1
14—	...	6	...	1·4
15—	...	7	...	1·6
16—	...	4	...	0·9
17—	...	0	..	0·0
18—	...	1	...	0·2
Total	...	443	...	100·0

The lowest sample was one which contained 7·2 per cent. of total solids, being adulterated with 43 per cent. of water, a shocking example of what a milk-man can do at times. The best sample contained 18·7 per cent. It will be seen that twenty-five per cent. of the samples contained less than 12 per cent. of total solids, and were either of low quality or adulterated; that seventy-one per cent. were of good quality, having 12–14 per cent.; the remaining four per cent. containing over 14 per cent. of total solids, and being of excellent quality.

Boric acid was found to be present in sixteen samples of milk in quantities varying from three to one hundred and thirty grains per gallon. Four of the samples were of low quality, two contained added water, three contained formic aldehyde one of them being also skimmed.

The vendor of the sample containing one hundred and thirty grains of boric acid per gallon was prosecuted. At the hearing of the case my evidence was supported by that of Dr. Carter, Physician to the Queen's Hospital. He stated that in his practice he had found the continued use of boric acid undesirable, as it produced symptoms of indigestion, and occasionally affected the heart and skin. He had made experiments which showed that moderate doses retarded the action of the saliva. Boric acid was a substance foreign both to the body and to milk. He considered such a milk prejudicial to health, and that in a child it might set up irritation leading to fatal results. Dr. Bond and Dr. Hake were called for the defence; they both admitted that the quantity of boric acid used was unnecessarily large. The farmer who supplied the milk stated in evidence that he had added a *solid* preservative to the churn of milk, and it appeared probable that, owing to the slow solubility of boric acid, the milk supplied to the Inspector by the vendor contained more than its share of preservative. The Magistrates considered the amount of boric acid present to be excessive, and fined the defendant 2s. 6d. (!) and costs. In a case like this, where four experts agreed that the quantity used was unnecessarily large, and the magistrates stated their opinion that it was excessive, one is astonished that such

a paltry fine should have been inflicted. In your last prosecution for boric acid in milk, 75 grains per gallon were present, and the fine was 5s. and costs; in this case the quantity was considerably more, and yet the fine was only 2s. 6d. I may point out that the vendor was not summoned under Section 3 of the Sale of Food and Drugs Act for selling an article injurious to health, but under Section 6, so that the only question the Magistrates had to decide was whether milk containing boric acid was "of the nature, substance, and quality of the article demanded." Of course it is not, and milk containing preservatives should not be sold as "milk," but as "borated milk" or "milk preserved with formic aldehyde," as the case may be, or with some description which states exactly what it is.

Formic aldehyde was detected in thirty-two samples of milk, three samples also contained boric acid, and five were either of low quality or deficient in fat. At the request of your Committee I made a special report on the subject of formic aldehyde, of which the following forms part.

> "According to Mr. Stokes, Public Analyst for Paddington, etc., it is commonly found in strong doses in milk from Normandy, and it is said to have been tried by London dairymen, but without much success."
>
> "From the experiments of F. D. Simons, it appears that one effect of formic aldehyde is to retard digestion, and Wiegle and Merkel found that it rendered milk less digestible by making the casein less soluble. Even a very weak solution containing one part of "formalin" in 2,000 (equivalent to about one part of formic aldehyde in 5,000) was found to harden fish to such an extent as to make it unsaleable, and the attempt to preserve fish by this means had to be abandoned."
>
> "From these observations it will be seen that formic aldehyde appears to have a very marked action on certain food stuffs, and is therefore likely to lead to indigestion and its attendant ills. In addition to this, it is most objectionable to add a drug of any kind to common articles of food. It is also objectionable on the ground that by the addition of a preservative, stale milk may be palmed off on the customer as fresh; and on all these grounds I strongly object to formic aldehyde as a food preservative."
>
> "There has been a prosecution in Liverpool, when it was contended that milk did not need any preservative, that the use of formic aldehyde enabled a dealer to sell stale milk as fresh, and obviated the necessity of cleanliness of the dairy. It also made the milk indigestible and had an irritant action on the mucous membranes. Professor Boyce, of the University College, and Mr. Williams, the Public Analyst, asserted that formalin in milk was quite unnecessary and most objectionable. Mr. Davies, analytical chemist, and Dr. Barrow were called for the defence and expressed

the opinion that the amount of formalin said to have been used would not be injurious to health. The Stipendiary Magistrate expressed himself, however, as on the side of the cow against the chemist, and inflicted a fine of £5 and costs. Notice of appeal was given but was subsequently withdrawn."

Twenty vendors of adulterated milk have been cautioned by the Health Sub-Committee. Thirty-one vendors have been prosecuted and fined, in three cases the vendors were only ordered to pay the costs of the prosecution, one summons against a retail dealer was withdrawn as the wholesale dealer who supplied the sample was fined, and one vendor absconded. Particulars are given in the subjoined lists.

In several cases farmers have been convicted of sending adulterated milk to Birmingham. Samples Nos. 248, 249, and 250, all from the same vendor, were flagrant cases, as they contained 31 per cent., 43 per cent., and 30 per cent. of added water respectively. Nos. 155, 156, 157, and 158 from another vendor contained 6 to 10 per cent. of added water. These vendors were fined £5 and costs each. Nos. 78, 112, and 120 were also from a farmer; he was fined £6 and costs. These penalties do not appear to err on the side of severity, as each vendor sent several adulterated samples.

NO.	DATE.	ADULTERATION.	ACTION.
22	Jan. 13th	Fat deficient 23%	Fined 5s. and 8s. costs.
24	„ 13th	Water in excess 10%	Fined 10s. and 8s. costs.
27	„ 13th	Fat deficient 22%	Fined 5s. and 8s. costs.
78	„ 31st	Water in excess 16% and fat deficient 7%	Fined £3 and 15s. 3d. costs.
112	Feb. 3rd	Water in excess 11%	Fined £3 and 15s. 3d. costs.
120	„ 4th	Water in excess 6%	No action, same vendor as Nos. 78 and 112.
155	„ 22nd	Water in excess 6%	No action, same vendor as No. 156.
156	„ 22nd	Water in excess 9%	Fined £5 and 21s. 6d. costs
157	„ 23rd	Water in excess 5%	No action, same vendor as No. 156.
158	„ 23rd	Water in excess 10%	Ordered to pay cost. amounting to 17s. 6d. same vendor as No. 156.
162	„ 24th	Water in excess 17%	Fined 5s. and 8s. costs.
166	„ 24th	Fat deficient 26%	Fined 10s. and 8s costs.
215	Mar. 10th	Water in excess 5% and fat deficient 14%	Fined 10s. and 8s. costs.
220	„ 10th	Fat deficient 25%, artificially coloured	Vendor absconded.
248	„ 18th	Water in excess 31%	Fined £5 and 16s. 8d. costs.
249	„ 18th	Water in excess 43%	Ordered to pay costs amounting to 13s. 8d., same vendor as No. 248
250	„ 18th	Water in excess 30%	Ordered to pay costs amounting to 13s. 8d., same vendor as No. 248
273	„ 24th	Fat deficient 30%	Fined £1 and 8s costs.
277	„ 25th	Fat deficient 20%	Fined £1 and 8s. costs
280	Mar. 25th	Fat deficient 28%	Fined £1 and 8s. costs.
281	„ 25th	Fat deficient 27%	Fined £1 and 8s. costs.
352	Apr. 26th	Water in excess 30 %, coloured	Summons withdrawn, wholesale dealer being fined for No. 431

NO.	DATE.	ADULTERATION.	ACTION.
431	May 17th ...	Water in excess 11% and fat deficient 14%	Fined £2 and 10s. costs.
439	,, 17th ...	Fat deficient 35%	Fined 10s. and 8s. costs.
506	June 10th ...	Fat deficient 25%	Fined £1 and 8s. costs.
541	,, 20th ...	Fat deficient 36%, formic aldehyde ...	Fined £1 and 8s. costs.
563	,, 23rd ...	Water in excess 13%, formic aldehyde ...	Fined £2 and 8s. costs.
613	July 6th ...	Fat deficient 38%	Fined 5s. and 8s. costs.
630	,, 11th ...	Fat deficient 31%	Fined 10s. and 8s. costs.
755	Sept. 23rd...	Water in excess 9% and fat deficient 11%	Fined 5s. and 8s. costs.
758	,, 23rd...	Boric acid 130 grains per gallon	Fined 2s. 6d. and 14s. costs.
759	,, 23rd...	Fat deficient 23%, boric acid 7 grains per gallon, formic aldehyde	Fined £1 and 8s. costs.
874	Oct. 26th...	Water in excess 26%	Fined 10s. and 9s. costs.
1060	Dec. 13th...	Water in excess 15% and fat deficient 31%	Fined £3 and 10s. costs.
1061	,, 13th...	Water in excess 15% and fat deficient 16%	Fined £1 and 8s. costs.
1077	,, 16th...	Water in excess 10%	Fined £5 and 9s. costs.
1111	,, 19th...	Fat deficient 19%	Fined 5s. and 8s. costs.

Six samples were submitted as "skimmed milk," but in no case was that a correct description of the article. Three of the samples had been watered but not skimmed, while two of them were genuine milk containing a fair proportion of fat, the other (No. 606) was a watered sample of "separated milk." Separated milk, or milk from which the cream has been mechanically removed by centrifugal force, generally contains less than 0·3 per cent. of fat, while milk from which the cream has been removed by ordinary hand skimming contains about 1 per cent of fat; according to a recent legal decision "separated milk" cannot be sold as "skimmed milk." I therefore certified the sample as deficient of fat as well as adulterated with water.

NO.	DATE.	ADULTERATION.	ACTION.
263	Mar. 24th...	Water in excess 11%	Fined £1 and 9s. costs.
606	July 4th ...	Water in excess 4% and fat deficient 50%	No action.
1046	Dec. 6th...	Water in excess 35%	Fined £5 and 8s. costs.

Table E.—Milk.

Years.	Samples per Annum.	Percentage of Adulteration.		Cautions per Annum.	Prosecutions per Annum.	Fines per Annum.
		Preservatives only.	Other ways.			£ s. d.
1873-76	28	—	54	0	8	5 5 0
1877-81	56	—	54	3	15	17 7 0
1882-86	184	—	31	18	28	26 4 5
1887-91	206	—	19	15	17	28 2 11
1892-96	354	—	16	24	33	38 2 5
1894	340	—	10	9	21	21 5 0
1895	325	—	18	16	39	43 6 0
1896	470	5	14	38	49	72 13 0
1897	399	7	14	27	44	58 6 0
1898	449	9	11	20	36	46 12 6

The slightly larger percentage of adulteration with preservatives only in 1898 was entirely due to the increased use of formic aldehyde, as it was present in twenty-seven samples of milk, while in the previous year it was only present in twelve samples. In 1897, fifteen samples were condemned because of the presence of boric acid; last year thirteen samples were adulterated in this manner.

The percentage of adulteration in other ways than by preservatives, viz., eleven per cent., was lower than in any previous year, except 1894, when ten per cent. were thus adulterated.

The Report of the Local Government Board for 1897 shows that fifteen per cent. of the samples of milk examined in London were adulterated, and ten per cent. of the number analysed in England and Wales, but no information is given as to what proportion of the samples were condemned because of the presence of preservatives.

Butter.

Of the 326 samples examined, twenty-four, or seven per cent., were adulterated with foreign fat; in twenty cases boric acid was also present. Sixty-four of the remaining 302, or twenty-one per cent., were adulterated with boric acid. In one case (No. 299), seventy grains per pound was present and the vendor was prosecuted and fined. At the hearing of the case I gave evidence that boric acid was a drug having powerful physiological effects, and that in my opinion the regular continued use of the butter was liable to have an injurious effect on either the skin, heart, kidneys, or digestive system. I pointed out that boric acid differed from salt in having very little taste, and the consumer therefore would not be able to tell if an excess of it was present; that a microscopical examination of the butter showed numerous crystals of boric acid, these crystals being in the solid state were useless for the preservation of the butter, although exerting the same physiological effect when swallowed as if they were in solution. I stated that I had found the drug in cream, clotted cream, bacon, pork-pie, sausage, polony, ham and tongue, and pickled tongue, and that if its use were permitted there was a great danger that a considerable and dangerous amount of it might be daily taken without the knowledge of the consumer. The addition of preservatives to butter is unnecessary, as it will keep good for several weeks, and if deposited in a refrigerator it will do so indefinitely. Dr. A. P. Luff, of the Home Office, also gave evidence. He stated that five cases were recorded in which the surgical use of boric acid had produced death; he considered that if half a pound of the butter were regularly consumed per week, the five grains per day of boric acid thus taken would depress the heart, irritate the kidneys, and produce disorders of the alimentary canal. He would advise that the use of boric acid in food should be prohibited. Dr. C. T. Vachell, Physician to the Cardiff Infirmary, gave evidence that in his practice he had found that regular doses of five or ten

grains of boric acid given to adults had produced eczema and necessitated the discontinuance of the remedy for a time. He considered that it should not be used in food at all. The Magistrates fined the defendant £1 and £5 costs in addition to the Court costs of 16s. 6d.

In another case (No. 521) the quantity of boric acid present was seventy-seven grains per pound. The vendor was fined £2 and costs.

Six vendors of adulterated butter were cautioned by the Health Sub-Committee and twenty-six prosecutions were instituted in addition to those under the Margarine Act; one case was withdrawn, as the vendor was fined for two other samples; in the other cases, fines varying from 5s. to £20 were inflicted. In the case of sample No. 667 the vendors appealed to the Quarter Sessions, on the grounds that the words, "Finest pure butter, guarranted," branded on the lid of the butter tub, constituted a legal written warranty, and that the fine (£20) was excessive. The Recorder dismissed the appeal with costs, and said he did not think the penalty at all severe in a case of that kind: he refused to state a case on the point of law.

NO.	DATE.	ADULTERATION.	ACTION.
34	Jan. 19th	Foreign fat 55%, boric acid	Fined £3 and 9s. costs.
67	,, 28th	Foreign fat 85%	Fined £2 and 9s. costs.
114	Feb. 3rd	Foreign fat 55%, boric acid	Fined £3 and 9s. costs.
118	,, 3rd	Foreign fat 75%, boric acid	Fined £2 and 10s. costs.
123	,, 8th	Foreign fat 50%, boric acid	Fined £3 and 8s. costs.
124	,, 8th	Foreign fat 50%, boric acid	Summons withdrawn, same vendor as Nos. 114 and 123.
132	,, 12th	Foreign fat 55%, boric acid	Fined £3 and 9s. costs.
136	,, 16th	Foreign fat 64%, boric acid	Fined £3 and 9s. costs.
172	,, 25th	Foreign fat 70%, boric acid	Fined £5 and 13s. 6d. costs.
197	Mar. 3rd	Foreign fat 55%, boric acid	Fined £1 and 9s. costs.
210	,, 3rd	Foreign fat 65%, boric acid	Fined £1 and 9s. costs.
211	,, 3rd	Foreign fat 79%, boric acid	Fined 5s. and 9s. costs.
226	,, 11th	Foreign fat 70%, boric acid	Fined £10 and 9s. costs.
234	,, 11th	Foreign fat 75%	Fined £10 and 9s. costs.
287	,, 29th	Foreign fat 48%, boric acid	Fined 10s. and 9s. costs.
299	,, 31st	Boric acid 70 grains per pound	Fined £1 and £5 16s. 6d. costs.
331	Apr. 20th	Foreign fat 83%, boric acid	Fined £2 and 9s. costs.
344	,, 22nd	Foreign fat 70%, boric acid	Fined £1 and 11s. costs.
521	June 16th	Boric acid 77 grains per pound	Fined £2 and 9s. costs.
667	July 19th	Foreign fat 20%, boric acid 21 grains per pound	Fined £20 and 12s. costs.
808	Oct. 10th	Foreign fat 60%, boric acid	Fined £2 and 9s. costs.
810	,, 10th	Foreign fat 40%	Fined £5 and 11s. costs.
844	,, 19th	Foreign fat 70%, boric acid	Fined £5 and 9s. costs.
911	Nov. 7th	Foreign fat 30%, boric acid	Fined £5 and 9s. costs.
912	,, 7th	Foreign fat 80%, boric acid	Fined £2 and 8s. costs.
1139	Dec. 22nd	Foreign fat 75%	Fined £5 and 10s. costs.

TABLE F.—BUTTER.

Years.	Number of Samples.	Percentage of Adulteration.		Cautions.	Prosecutions.	Fines.		
		Preservatives only.	Other ways.			£	s.	d.
1873-81	36	—	17	0	3	1	5	0
1882-86	153	—	35	14	32	18	18	6
1887-91	365	—	26	12	68	100	17	6
1892-96	931	—	13	23	109	209	4	6
1894	228	—	14	1	29	72	10	0
1895	203	—	14	0	29	59	17	6
1896	238	30	9	18	21	49	10	0
1897	281	33	10	0	27	77	15	0
1898	326	20	7	6	26	96	15	0

The number of samples of butter analysed in 1898 was larger than in any previous year. Twenty per cent. of the samples were adulterated with boric acid; this proportion, though large, is a decided improvement on the two previous years, when thirty and thirty-three per cent. respectively were thus adulterated.

Foreign fat was found in only seven per cent. of the samples, a lower proportion of adulteration than in any recent year. Part of this decrease is due to the fact that in some cases it has been considered advisable to prosecute under the Margarine Act for samples bought as butter. If the samples taken under the Margarine Act are counted as adulterated butters, thirteen per cent. of the samples last year were adulterated, against fourteen to sixteen per cent. in the previous four years.

The steady increase in the amount of the fines shows that the Magistrates are beginning to realise that the profits obtained by the substitution of margarine for butter prevents the infliction of small fines having much deterrent effect. The average of the fines last year was £3 17s. 5d. against £2 7s. 7d. the average for 1897. In addition to the £96 15s. 0d. shown above a sum of £101 6s. 0d. was paid as fines in cases under the Margarine Act.

Fourteen per cent. of the samples analysed in London during 1897 were adulterated, and ten per cent. of those examined in England and Wales, but no information is given as to what proportion were adulterated with preservatives.

COFFEE.

Eight of the eighty-three samples of coffee received were adulterated with chicory; the vendor of each sample was prosecuted and fined. In the case of sample No. 1,026 the presence of the 14 per cent. of chicory was explained by the vendor as being due to the coffee

having been ground in a machine which had not been cleaned after it had been used for grinding chicory.

In 1897, fifteen per cent., an unusually large proportion, of the samples of coffee analysed in Birmingham were adulterated, the ten per cent. of adulteration last year was slightly above the average and was the same proportion of adulteration as that found in London and in England and Wales during 1897.

The following were the adulterated samples:—

NO.	DATE.	ADULTERATION.	ACTION.
519	June 16th	Chicory 65%	Fined £3 and 9s. costs.
528	„ 16th	Chicory 55%	Fined £3 and 9s. costs.
555	„ 21st	Chicory 60%	Fined £3 and 9s. costs.
558	„ 21st	Chicory 45%	Fined £3 and 9s. costs.
943	Nov. 18th	Chicory 70%	Fined £5 and 9s costs.
945	„ 18th	Chicory 75%	Fined 5s. and 13s. 6d. costs
984	„ 24th	Chicory 25%	Fined 5s. and 9s. costs.
1026	Dec. 2nd	Chicory 14%	Fined £1 and 13s. costs.

TABLE G.—COFFEE.

Years.	Number of Samples.	Percentage of Adulteration.	Cautions.	Prosecutions.	Fines. £ s. d.
1873-81	86	14	0	3	1 5 0
1882-86	92	43	23	1	1 10 0
1887-91	113	37	0	5	1 10 0
1892-96	276	6	4	13	21 6 0
1894	57	7	1	3	5 1 0
1895	90	9	3	5	6 0 0
1896	53	9	0	5	10 5 0
1897	142	15	3	18	29 15 0
1898	83	10	0	8	18 10 0

SPIRITS.

Twenty-five samples of spirits were examined, viz., fourteen of *Scotch* and eight of *Irish whiskey*, and three of *gin*. One sample of *Irish whiskey* was rather weak. One sample of *Scotch whiskey* (No. 498) was adulterated with $5\frac{1}{2}$ per cent. of water, and the vendor was fined £5 and 9s. costs. One sample of *gin* was adulterated with 2 per cent. of water, and the vendor was cautioned by the Health Sub-Committee. The other samples were genuine.

Eight per cent. of the samples of spirits examined last year in Birmingham were adulterated, against twelve per cent. in the previous year. In 1897, nine per cent. of the samples of spirits examined in London and fifteen per cent. of those examined in England and Wales were adulterated.

TABLE H.—SPIRITS.

Years.	Number of Samples.	Percentage of Adulteration.	Cautions.	Prosecutions.	Fines.
					£ s. d.
1873-81	56	54	0	6	5 10 0
1882-86	35	23	3	2	0 5 0
1887-91	30	13	4	0	...
1892-96	107	16	7	10	20 0 0
1894	32	25	3	5	6 0 0
1895	24	21	1	4	12 0 0
1896	18	11	2	0	...
1897	24	12	2	1	1 0 0
1898	25	8	1	1	5 0 0

ALE, BEER.

One of the eleven samples of *ale* was adulterated, containing 105 grains per gallon of chlorides expressed as salt. No action was taken owing to the bursting of the Inspector's reserve sample. One sample of *ale* and two of the seven samples of *beer* contained rather too much salt, but the excess was not sufficient to be called adulteration.

SHERRY.

Eleven of the twelve samples were of the ordinary quality, but No. 104 contained two grains of salicylic acid per gallon. The vendor was cautioned by the Health Sub-Committee.

FLOUR, SELF-RAISING FLOUR.

The thirty-two samples of *flour* examined were all free from alum, one of them contained about two per cent. of maize flour, but I did not consider the quantity sufficient to be certified as adulteration.

Five of the twenty-two samples of *self-raising flour* were adulterated with 8 to 40 per cent. of maize flour. In one case the bag was marked "made from a blend of the finest English, Hungarian, and maize flour," but this statement was made in small type and was at the bottom of the bag, so that most purchasers, unless they read all the recipes on the bag, would be ignorant of the presence of maize.

In two cases the vendors were cautioned by the Heath Sub-Committee; in two others action was not taken, as the offence was similar to that in the following case, in which an appeal is pending.

The Southampton Food and Drugs Inspector asked for "flour," and was supplied with a sample containing 35 per cent. of ground maize. The Magistrates dismissed the prosecution, holding that "wheaten flour" should have been asked for, and that ground maize was "flour." They refused to grant a case for appeal. The Authority obtained a rule from the Court of the Queen's Bench compelling the Magistrates to state a case, but this has not yet been decided.

In addition to the above, two samples contained about one per cent. of maize flour, but were not certified as adulterated.

Other Foods.

Thirty-four samples of *pepper*; thirty-two of *bread*; twenty-seven of *Demerara* and five of *granulated sugar*; eleven of *vinegar*; eight of *oatmeal*; five of root *ginger*; and one of *ground rice* were all found to be genuine.

II.—SAMPLES OF DRUGS.

The following table gives a list of the drugs analysed last year, classified as genuine, and adulterated.

Table J.—Samples of Drugs.

	No. of Samples Analysed.	No. found to be Genuine.	No. found to be Adulterated.
Compound Tincture of Benzoin ...	9	6	3
Tincture of Rhubarb	8	8	0
Tincture of Iodine	5	4	1
Borax	4	1	3
Prescription-Pills	1	1	0
Total	27	20	7

Last year a new British Pharmacopœia was issued, in which a large number of changes were introduced in the directions for preparing medicines. Probably with the intention of allowing chemists time to dispose of articles which were prepared under the direction of the 1885 Pharmacopœia, the number of samples of drugs submitted to me in 1898 was smaller than in any recent year; the percentage of adulteration was, however, rather higher than usual.

Table K.—Drugs.

Years.	Number of Samples.	Percentage of Adulteration.	Cautions.	Prosecutions.	Fines.
					£ s. d.
1873-81	79	23	0	0	...
1882-86	76	29	7	0	...
1887-91	443	15	13	7	16 0 0
1892-96	517	23	60	25	28 5 0
1894	148	20	10	8	15 0 0
1895	75	23	9	8	3 5 0
1896	67	24*	13	3	...
1897	108	19	7	4	11 1 0
1898	27	26	2	4	1 15 0

* 3 per cent. of the samples were adulterated with preservatives only.

Compound Tincture of Benzoin.

Of the nine samples received the following three were found to be adulterated :—

NO.	DATE.	ADULTERATION.	ACTION.
81	Jan 31st ...	Solid ingredients deficient 23%	Cautioned.
90	„ 31st ...	Water 20%, glycerine 25%, solid ingredients deficient 65%	Fined £1 and 9s. costs.
97	Feb. 21st ...	Solid ingredients deficient 16%	Cautioned.

Tincture of Rhubarb.

Seven of the eight samples received were of satisfactory quality ; one contained a little suspended vegetable matter, but was otherwise of the correct composition.

Tincture of Iodine.

Four of the five samples received were of the correct composition, but No. 92 contained 17 per cent. of iodine in excess of the proper quantity. No action was taken as the vendor was prosecuted for the sale of tincture of benzoin, No. 90.

Borax.

Only one of the four samples of borax was genuine : the other three samples were adulterated as follows :—

NO.	DATE.	ADULTERATION.	ACTION.
602	July 5th ...	Bicarbonate of soda 35%	Fined 5s. and 8s. costs
603	„ 5th ...	Bicarbonate of soda 35 %	Fined 5s. and 8s. costs.
604	„ 5th ...	Bicarbonate of soda 25%	Fined 5s. and 8s. costs.

Prescription—Pills.

The sample of pills received containing arsenic and dried sulphate of iron was not altogether satisfactory, as there was a slight deficiency of iron and the pills were not so uniformly divided as I consider carefully dispensed pills should be.

III.—MARGARINE ACT.

Twenty two prosecutions were instituted last year for offences under the Margarine Act. That Act requires that "every person selling margarine by retail . . . . shall in every case deliver the same to the purchaser in or with a paper wrapper, on which shall be printed in capital letters, not less than a quarter of an inch square, 'Margarine.'" In thirteen instances this requirement was not complied with.

Four persons did not obey the directions that "if margarine be exposed for sale, by retail, there shall be attached to each parcel thereof so exposed, and in such manner as to be clearly visible to the purchaser, a label marked in printed capital letters not less than one and a half inches square, 'Margarine.'"

In four cases a manufacturer was prosecuted for consigning a package not "branded or durably marked 'Margarine' on the top, bottom, and sides, in printed capital letters, not less than three-quarters of an inch square." The same manufacturer was also fined for manufacturing margarine in a factory which was not registered in accordance with Section 9 of the Margarine Act.

In eighteen of the twenty-two prosecutions the vendor was fined; one case was dismissed on the production of a warranty from the wholesale dealer, who was fined; in the remaining cases the vendors had been fined for other samples.

The fines inflicted amounted to £101 6s.; this is a much larger sum than that paid in any previous year. The costs of the prosecutions paid by the vendors were £8 13s.

With two exceptions boric acid was present in all the samples of margarine.

The following table shows the results of the actions taken under this Act during past years:—

TABLE L.—MARGARINE ACT.

Year.	Samples	Cautions.	Prosecutions.	Amount of Fines.	Average Fine.
				£ s. d.	£ s. d.
1889	1	0	1	1 0 0	1 0 0
1890	2	1	1	0 5 0	0 5 0
1891	4	0	4	5 10 0	1 7 6
1892	2	1	1	...	...
1895	1	0	0	...	...
1896	20	4	16	59 0 0	3 13 9
1897	20	0	14	29 15 0	2 5 9
1898	21	0	22	101 6 0	5 12 7

NO.	DATE.	OFFENCE.	ACTION.
33	Jan. 19th...	Retail sale, unmarked	... Fined £1 and 9s. costs.
35	" 19th ..	Retail sale, unmarked	... Fined £3 and 9s. costs.
49	" 21st...	Retail sale, unmarked	... Fined £1 and 9s. costs.
125	Feb. 8th ...	Unlabelled when exposed for sale...	... Fined £5 and 9s. costs.
144	" 16th ...	Retail sale, unmarked	... Fined £2 and 8s. costs.
146	" 16th ...	Unlabelled when exposed for sale...	... Ordered to pay costs amounting to 4s., same vendor as No. 144
376	Apr. 30th...	Retail sale, unmarked	... Fined £5 and 9s. costs.
809	Oct. 10th...	Retail sale, unmarked	... Fined £5 and 9s. costs.
845	" 19th...	Retail sale, unmarked	... Fined £5 and 8s. costs.

NO.	DATE.	OFFENCE.	ACTION.
913—	Nov. 7th...	Unlabelled when exposed for sale... ...	Fined £2 and 8s. costs.
914—	„ 9th...	Retail sale, unmarked	Dismissed on production of warranty from vendor of Nos. 919-922
918—	„ 9th...	Retail sale, unmarked	Fined 1s. and 9s. costs. Obtained from vendor of Nos. 919-922.
919—	„ 9th...	Wholesale consignment, unmarked ..	Fined £20 and 13s. costs.
920—	„ 9th...	Wholesale consignment, unmarked ...	Withdrawn. Same vendor as Nos. 919 and 921
921—	„ 9th...	Wholesale consignment, unmarked ...	Fined £20 and 13s. costs.
922—	„ 9th...	Wholesale consignment, unmarked ...	Withdrawn. Same vendor as Nos. 919 and 921.
—	„ 9th..	Unregistered factory	Fined £2 and 9s. costs. Maker of Nos. 919-922.
952—	„ 18th...	Retail sale, unmarked	Fined £5 and 9s. costs.
1006—	„ 30th...	Retail sale, unmarked	Fined £5 and 10s. costs.
1074—	Dec. 14th...	Retail sale, unmarked	Fined £10 and 10s. costs.
1090—	„ 16th...	Retail sale, unmarked	Fined £10 and 10s. costs.
1140—	„ 22nd...	Unlabelled when exposed for sale... ...	Fined £5 and 10s. costs.

IV.—LEGAL PROCEEDINGS.

Your Committee cautioned the vendors of adulterated articles in thirty-two cases, and prosecuted in ninety-seven others. In eighty-seven instances fines were inflicted; four persons were ordered to pay the costs of the prosecution; four cases were withdrawn, the vendors or the wholesale dealer being fined for other samples. One case was dismissed on the production of a warranty; and one vendor absconded.

The following table shows what articles were found to be adulterated, with the proceedings taken, and the amount of the fines inflicted.

Table M.—Legal Proceedings.

ARTICLES.	ADULTERATED.	CAUTIONED.	FINED.	AMOUNT OF FINES £ s. d.
Milk	91	20	31	46 12 6
Butter	88	6	25	96 15 0
Coffee	8	0	8	18 10 0
Self-Raising Flour ...	5	2	0	...
Compound Tincture of Benzoin	3	2	1	1 0 0
Borax	3	0	3	0 15 0
Tincture of Iodine ...	1	0	0	...
Sherry	1	1	0	...
Scotch Whiskey ...	1	0	1	5 0 0
Gin	1	1	0	...
Ale	1	0	0	...
Food and Drugs Act ...	203	32	69	168 12 6
Margarine Act ...	22	0	18	101 6 0
Total	225	32	87	£269 18 6

The amounts of the fines inflicted were as follows :—

The fine was	£20	in	3 cases
"	£10	"	4 "
"	£5	"	17 "
"	£3	"	13 "
"	£2	"	11 "
"	£1	"	17 "
"	10s.	"	7 "
"	5s.	"	13 "
"	2s.6d.	"	1 case
"	1s.	"	1 "
	Total		87 cases

The average fine inflicted under the Sale of Food and Drugs Acts was £2 8s. 11d., and under the Margarine Act £5 12s. 7d. The legal costs paid by the vendors amounted to £49 1s. 0d.

I remain,

Mr. Chairman and Gentlemen,

Your obedient Servant,

ALFRED HILL, M.D., F.I.C.,

City Analyst.

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